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PREFATORY MEMORANDUM.

In presenting this volume to the Medical Department, the Medical Board entertain the hope, that it will be found as useful as the last; it is probably possessed of more interest, the subjects being more varied. Diseases of Natives, as in the preceding however occupies a large portion of the present volume.

For some time past, much of the attention of the Board has been directed to the subject of the substitution of Drugs the produce of India, for those procured from Europe; and the reports and observations now given, will tend to secure a lively interest in this important subject on the part of medical officers generally. It has been demonstrated that Fish Liver oil prepared on the shores of India, is equal in every respect to the expensive article imported from England; hyoscyamus, digitalis and several other medicines are now procured locally, and their therapeutic effects have been proved to be equal to those supplied from other sources, and so it will ere long appear with regard to many other medicines. Several essential oils have been brought to notice possessed of properties similar to those imported from Europe; and when experimental or practical Chemistry is more largely developed in India, most of the preparations will be locally available.

The Board have to express their regret, that this volume has been delayed so long beyond the period fixed upon for its issue; arrangements however have been made to prevent a similar occurrence in future.

Fort St. George,
Medical Board Office,
17*th December*, 1855.

By Order,
ALEX. LORIMER, M. D.,
Secretary Medical Board.

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OBSERVATIONS ON THE TREATMENT OF INTERMITTENT FEVER, BY PHOSPHATE OF LIME WITH SULPHUR.

BY ASSISTANT SURGEON A. BLACKLOCK,

23d Regiment, W. L. I.

"If any one, in the present case, promises demonstration, his undertaking is certainly too much: if he desires or expects it from another, he requires too much. There are, indeed, very few demonstrations in philosophy, if you except Mathematical Sciences, that can be truly and strictly so called; and, if we inquire narrowly into the matter, perhaps we shall find none at all; nay, if even the Mathematical demonstrations are examined by the strict rules and ideas of Aristotle the greatest part of them will be found imperfect and defective. The saying of that philosopher is, therefore, wise and applicable to many cases." "Demonstrations are not to be expected in all cases, but so far as the subject will admit of them."

ARCHBISHOP LEIGHTON.

As the following considerations on Intermittent Fever and its treatment by Phosphate of Lime may at first sight appear to some minds more curious in their nature than profitable in their tendencies, I would predispose the reader to a lenient criticism by premising a few words on the difficulties which beset us in entering upon an investigation like the present.

The mental power of the wisest of our profession, in every period, from a very remote antiquity, has been freely employed on the subject of fever, yet our knowledge of the primary causes of many of its phenomena is still very limited, while the actual mode of action of most of our febrifuges is likely to remain an open question till important particulars in organic chemistry, with their bearings on animal vitality, are more satisfactorily determined than they are likely to be for some years to come. We have very little positive knowledge of the mode of origin of fevers. Some are clearly occasioned by local or by general irritation; others are, with

some show of reason, ascribed to the introduction of an animal ferment from without, or to its spontaneous formation within the system, through some error of secretion. Miasmata and Electricity assist us in part in endeavouring to solve the mystery, and partly render the mystery still more mysterious. Even a cryptogamic origin has been assigned to certain fevers. But much of our present knowledge of this subject is entirely of a negative nature, and the amount of really well ascertained and positively valuable information on the nascent state of febrile affections appears to be but small and insignificant indeed.

Medicine has been well described as the most uncertain of the Sciences, though it is based in part upon truths which pertain to other sciences and admit of most rigorous demonstration. We are to some extent acquainted with the molecular and atomic constitution of the human body in health, and with the changes which cells and cell products are subject to in the progress of disease; but we are almost entirely ignorant of the nature of the errors, be they vital or be they chemical, in which the simplest morbid processes are originated. Much of this ignorance or uncertainty is occasioned by the peculiar inherent difficulties attending all such investigations, or rather in the impossibility of subjecting the prime movers of morbid action, or even morbid actions themselves, to the test of experiment. The nature of the hidden spring is, to begin with, in general a subject of mere conjecture, while the train of subsequent morbid processes can only be made out at some few points whose interspaces must be filled in by the mental ingenuity of the observer, from attention to the few phenomena which present themselves under the name of symptoms at the surface. There has thus ever been great latitude for ratiocination on the subject of disease in general and of fever in particular. And the extent of supposition will not be diminished, and there will be abundance of doubt and uncertainty in the etiology of fevers, till their mode of origin and the leading governing principles of the morbid processes accompanying them are

more clearly defined and accounted for than they are at present.

The whole train of reasoning in the present paper is founded on observations which have led to the belief that loss of phosphates from disintegration of nervous tissue, or their deficiency in the circulating fluid, is a predisposing eause of fever. Whether or not this loss can be with truth assigned as one of the causes of fever we shall have to determine as we proceed. Organic chemists have drawn important, and I think fair, conclusions from data which appear to me not so perfeet as those which my experience has provided me with for the construction of the present view. Alterations in the relative amount of eercbrie acid in fevers, and the probable effeets of the nitrogenized compounds in favoring the production of that aeid for the repair of the nervous tissues, are neither very appreciable to the sense of the ehemist nor of easy demonstration to the medical profession ; yet Liebig has remarked, while speaking of the relation of vegetable alkalies to nervous matter, that "The time is not long gone by when we had not the slightest conception of the eause of the various effects of opium, and when the action of cinehona bark was shrouded in incomprehensible obseurity. Now that we know that these effects are caused by crystallizable compounds, whieh differ as much in composition as in their action on the system ; now that we know the substanees to which the medicinal or poisonous energy must be ascribed, it would argue only want of sense, to consider the action of these substances inexplicable."* Yet notwithstanding this hearty feeling of relianee on the capability of ehemical science in banishing the obscurities of therapeutics, and notwithstanding the profound knowledge and depth of thought which Liebig has brought to bear on the chemistry of organization, he has still left the mode of action of the alkaloids to a certain extent unaceounted for. And if Liebig with his large intelligence and numerous advan-

* Animal Chemistry by Justus Liebig, M. D. London 1812, p. 187.

tages be considered by some to have made only an approximation to a true theory of the action of nitrogenized vegetable products, and to have left it yet far from complete, though it may be true to nature so far as he has carried it, I may well trust the reader will be indulgent should I fail to explain myself satisfactorily or to enter into every minute particular connected with the easily proposed but not easily answered question of "*How does phosphate of lime with sulphur appear to cure some forms of intermittent fever.*

During the last 100 years, or more, bark has been a medicine of acknowledged efficacy in many kinds of fever, and for the last 40 years quinine has enjoyed a reputation as an antiperiodic greater than ever was attached to any other medicine; yet during these long periods we have never been furnished with any truly complete and satisfactory explanation of the manner in which they prevent or arrest febrile disturbance. And, if I may be allowed to compare small things to great, it is quite possible that such will be the case with many remedies yet to be introduced, my own among the number. While I would, therefore, dwell strongly on what I believe to be a fact, that phosphate of lime with sulphur is capable of arresting certain forms of fever, and imagine that in time many will see fit to place confidence in the combination, I would ask for but a moderate share of regard for the theory I have here attempted of its mode of action, as the fact I have stated may be a very true and valuable fact, while the theory may be a very poor theory, and may fall very far short of correctly elucidating the *modus operandi* of the medicine.

We sometimes meet with intermittents which cannot for years be made to yield to either quinine or climate. If there be any good foundation for the modern opinion that quinine arrests certain fevers by supplying a compound similar to cerebric acid to the nervous tissue, it is plain that we presuppose some proportion of that acid to be absent in fever, though we cannot obtain any direct experi-

mental proof. But if we allow that uncomplicated intermittent and remittent fevers are occasioned by the predisposition of the body to fever through the nervous system being deficient in tone from a diminution of the cerebric acid, we must also admit that a deficiency of any other constituent equally characteristic of nervous tissue may likewise predispose to febrile derangement. Now, in that tissue there are two acids, the Cerebric acid and Oleophosphoric acid, *both* peculiar to the tissue, and each of so much importance to its integrity of function that a deficiency of either is likely to be followed sooner or later by constitutional disturbance, the symptoms varying according to the nature and amount of the deficiency. No very accurate line of demarcation can be drawn between the parts of the nervous system which contain the largest proportions of cerebric acid, and those containing most oleophosphoric acid; but the former seems to abound most in the sympathetic ganglia and in the grey matter of the cerebro spinal system, while the latter is in greatest quantity in the white nervous substance. Quinine, which most resembles cerebric acid, has always been found most efficacious in those fevers which are attended with foul secretions and great liability to congestion of important organs, and which may, therefore, be regarded justly as having their origin in some defect in the constitution of the nerves of organic life; but cases are frequently met with where there is no decided derangement of important organs, and which yet experience only temporary relief from quinine, or refuse to yield to it altogether. It is fair then to infer that quinine, where it fails to benefit, is not the principle required to be supplied, and that there is a deficiency still to be made good by some other medicine. In fine, I am of opinion that, while quinine admirably fulfils the indications afforded by its chemical constitution, it can only supply one of two principles which appear to be deficient in the bodies of fever patients, and, therefore, cannot be of decided benefit in every case of fever; and I am inclined to

the belief that phosphate of lime will be found to make good the deficiency which most frequently leads to fevers among a large proportion of our native population. Quinine has been so long and so loudly extolled as an infallible remedy in the majority of the fevers of this country that it seems almost fair to ridicule the idea of its being equalled as a febrifuge by phosphate of lime in the majority of the cases which occur among natives, and of its being in many cases even superior to that alkaloid. But when we find some of the older and more experienced members of our service candidly confessing they have met with many cases in which bark and quinine have had but little satisfactory influence, it is time to inquire whether there may not be two classes of cases, the one requiring alkaloid remedies, the other earthy phosphates.*

During the last four years I have been gradually led by what I have observed in practice to consider the primary cause of intermittent and remittent fever to be a loss of balance between the nervous tissue and the other soft tissues of the body, and to ascribe the loss of balance in a large proportion of native cases to a deficiency of phosphates in the nervous matter. I had noticed many facts in the origin of these fevers and their amenability to treatment which appeared to be very discordant facts indeed; but which were rendered perfectly reconcileable on the supposition that they originated in a deficiency of phosphates in the nervous tissue or in the blood. I saw that these fevers were peculiarly prevalent in populations subsisting on a diet deficient in phosphates, and that even the people of districts well supplied with food abounding in these phosphates were also very subject to fever, notwithstanding the quality of their diet, if the atmospheric peculiarities of the district were favorable to the passing off of phosphates. I knew, what is known to most people, that the inhabitants of low lying places where the dew point is usually high, or persons passing through or re-

* Madras Medical Reports for 1850, p. 106, et Seq.

siding in damp apartments or jungles are very subject to intermittent and remittent fevers; and I had noted as a coincidence that wherever the dew point is commonly high the tendency to the passing of phosphates by the kidneys is nearly as remarkable as the liability to fever.

These observations were sufficient to lead me to suppose that the use of phosphates might be of some advantage in those fevers, and I therefore determined to make cautious trial of some phosphatic preparation. I was the more induced to experiment in the matter as I was at the time passing considerable quantities of phosphates during the early parts of the day, alternating with febrile disturbance and red sedimentary deposits during the night. I began accordingly to take drachm doses of phosphate of lime and magnesia in the hope of deriving much benefit from it; but, though the red deposits and the attendant fever were almost immediately arrested I found the relief was only very temporary, as the phosphatic sediments continued to appear as usual, and even seemed to be increased in quantity. I had long known that the performances of the kidneys depend very much upon the condition of the mucous surface of the lungs; and, as I was living on the east coast in an atmosphere peculiarly conducive to this alteration of renal secretion, through impressions on the respiratory surface, I surmised that, unless the action of the mucous membrane of the lungs were altered for the better, there would be no prospect of improving the function of the kidneys. I give this as the beginning of my reasoning on this subject. It is enough for my purpose to state at present that, as the air of certain parts of the low country adjoining the east coast appeared to me to encourage phosphatic deposits by its depressing effects on respiration, it became necessary to find a method of heightening the respiratory power in those cases where it was of consequence to retain in the body the phosphate which might be administered as food or medicine.

As I have among a few of my medical friends, earned a small reputation for empiricism by ascribing to *sulphur* an

important power which no one but myself has ever believed it to possess, namely, that of checking morbid actions in the nerves of organic life, while it at the same time increases the nervous power of the spinal respiratory surfaces, the reader may be inclined to smile at my simplicity in again bringing forward this neglected drug as a powerful agent in helping us to render the system tolerant of earthy phosphates; but I must hope he will ere long give sulphur with this view that he may be practically convinced as I am, that I am not disposed to over-estimate its value in controlling or arresting phosphatic deposition in cases where the deposit does not owe its origin to long standing disease of the kidneys or bladder, or to injuries of the spinal chord. Sulphur, however, possesses that virtue in a surprising degree; and I now found in my own case I had only to combine it with the earthy phosphates to ensure their being retained in the system, even under the disadvantage of continuing to reside in an atmosphere which there can be no question has at certain seasons the property of leading to their deposition.

I next proceeded to make trial of phosphate of lime mixed with sulphur in others having somewhat similar symptoms, and then ventured to test its powers in the milder forms of intermittent fever among natives. The success in these ordinary private cases was so satisfactory that I would have tried the remedy in any severe hospital case that might then have offered, had it not been for the necessity I would have been under of being prepared with satisfactory proofs on paper to convince my medical superior in the Division that I had good and sufficient reasons for introducing it into my public practice, and that I was not idly tampering with the lives of the public servants by ill-devised or ill-directed experiments. Not that there was any necessity for hesitating to give the phosphate on account of any direct injury so harmless a remedy could possibly occasion; but because the fevers of the Northern Division are so decided, and tend in so many instances rapidly to a fatal termination, that any me-

dicine, however harmless in itself, cannot but be regarded as negatively injurious in those fevers if its administration occupy the precious time which ought to be sedulously employed in arresting the fever by medicines of well tried and acknowledged efficacy. Sufficient and satisfactory reasons, however, for such an innovation in hospital practice I could not be expected to have ready at the call of higher authority at a distance, and therefore I had to wait for the occurrence of a severe case in private practice to test the real value of my remedy. No one has long to wait for the sight of a bad case of fever in the neighbourhood of the northern part of the east coast of India, and it happened that as I was soon after travelling past the Condapilly hills, the base of which is so notorious for severe agues, a healthy looking coolie in my employment was seized with intermittent in the severe form so common among the labouring classes of the Northern Division. He had intense shivering about three o'clock one afternoon followed towards evening by correspondingly increased heat of skin and delirium. At that time I gave him only an ordinary purgative of calomel and jalap, with warm tea to encourage perspiration. The following day he made his way to the next bungalow after being many hours on the road, and had about three o'clock in the afternoon a still more trying recurrence of the fever. I now, while he was delirious in the hot stage, forced him to swallow three drachms of phosphate of lime, with one drachm of sulphur, and in the course of an hour I was pleased to find the man sensible, and the perspiration coming with more than usual rapidity. Next day he got over his march in good time, and had the dose repeated early in the day. Two days afterwards he was carrying his burden and eating as usual, and had no return of the fever from the time he took the first dose of phosphate of lime till he quitted my service about a fortnight afterwards. Other cases of a milder character occurred while I was on this march and yielded as readily and satisfactorily to the same kind of treatment without the assistance of a single grain of bark or quinine.

Soon after this I happened to be detained for about four days in the jungle at a post station about 28 miles to the north of Neermul, and as I again began to suffer from phosphatic deposition and to experience the debility and irritability which usually precede fever, I again had recourse to the phosphate of lime with sulphur with the benefit I had derived on first using it. Another opportunity was afforded me at the time of trying its effects in a nearly similar case and with an equally favorable result. I made no scruple, therefore, when I assumed medical charge of the 23d regiment, W. L. I., and temporary charge of part of the 8th Light Cavalry, to employ the phosphate of lime with sulphur in the treatment of intermittent fever cases in both hospitals, and took an early opportunity of bringing its medicinal value to the notice of R. Davidson, Esq., the superintending surgeon of the force, who was pleased to countenance a continuance of the trial of its virtues as a substitute for quinine in certain forms of fever. Through his encouragement a very extensive trial was then made of the power of the phosphate of lime and a very fair body of evidence collected in its favor.

The majority of the cases of intermittent and remittent fever which have occurred in the hospital of the 23d regiment, W. L. I., since the 3d April 1849, have been treated more or less decidedly with this medicine, to the exclusion of bark, quinine, arsenic and the other antiperiodics; and it will be seen by a reference to the cases, taken from the hospital books, that though it was used with caution at first, more and more reliance has been placed upon its virtues till at last I may safely say it has enabled us to dispense with much of the emetic, purgative and alterative medicine usually regarded as essential to the management of fever.

Before proceeding further, however, it will be necessary to explain how the loss of balance, to which I have alluded, is likely to be brought about; and how a deficiency of phosphates in the circulating fluid may give rise to fever.

The diet may be deficient in phosphates, though to all appearance sufficiently nutritious for the requirements of all the tissues, and the blood may not be rich enough in materials to repair the waste of the nervous substance, or to supply it with healthy stimulation. To any one who has paid ordinary attention to the value of different articles of food for the various purposes of the body, as indicated by their constituents, the following table, drawn up, after careful inquiry, by that highly intelligent 2d Dresser P. M. Hyasawmy of the Kamptee civil dispensary, is calculated to afford some useful information, though I cannot turn it to as profitable account as I desire, owing to my want of statistics to show the comparative liability of the different classes of natives to fever.

MALABAR OR TAMIL SEPOYS.

10 A. M.	7 P. M.	
Rice lb. 1,	Rice lb. 1,	Meat curry about 3 days in the week.
Tyre oz. 12,	Mullagatunny, or Dhoil curry, sometimes fish.	
Meat oz. 4 or Dholl oz. 4,		
Vegetable 1 pice,		
Mussauls,		
Chillies,		
Coriander,		
Saffron,		
Cummin seeds.		
Mustard,		
Onions,		
Garlic,		
Tamarind about oz. ½ Ghee 4 pice weight, Greens.		

MALABAR OFFICERS.

10 A. M.	3 P. M.	8 P. M.	
Rice 8 to 12 oz.,	Milk lb. 1,	Rice 8 to 12 oz.,	Meat every day.
Meat oz. 4,	Rice oz. 8,	Mullagatunny,	
Mussaul (the same as above)	Sugar oz. 2.	Meat oz. 4,	
Ghee oz. 4,		Vegetable 1 pice,	
Mullagatunny,		Mussaul,	
Greens,		Ghee oz. 4.	
Dholl.			

Gentoo Sepoys.

10 A. M.	7 P. M.	
Rice lb. 1, Meat oz. 4 or Dholl oz. 2 with Rosal Green, Mussauls with an excess of Tamarind about oz. 2 or 3, Ghee 4 pice weight.	Rice lb. 1, Mullagatunny or Dholl curry, Rosal green, Ghee 4 pice weight, Sometimes fish.	Meat about 4 or 5 days in the week excess of Tamarind.

Gentoo Officers.

10 A. M.	7 P. M.	
Rice 8 to 12 oz., Meat oz. 4 or Dholl, Rosal green, Mussauls with an excess of Tamarind, Ghee 3 ounces, Mullagatunny.	Rice 8 to 12 oz., Meat or Dholl curry, Rosal green, Mullagatunny, Sometimes fish.	Meat every day, excess of Tamarind.

Mahomedan Sepoys.

8 A. M.	2 P. M.	8 P. M.	
Rice lb. 1, Meat oz. 4 or Dholl oz. 2 with vegetables, Mussauls with Tamarind about oz. ½, Ghee 4 pice weight.	Wheat flour (Bread) lb. ½ with Ghee and Sugar.	Rice lb. 1, Meat or Dholl curry.	Meat every day.

Mahomedan Officers.

7 A. M.	10 A. M.	2 P. M.	8 P. M.	
Soojee Conjee with Milk and Sugar.	Rice 8 to 12 oz. Meat oz. 4, or sometimes Dholl oz. 2, Vegetables, Mussauls, Ghee 4 pice weight.	Wheat Bread with Sugar and Ghee. Milk.	Rice oz. 8 Meat or Dholl curry.	Meat every day.

Rajpoot Sepoys.

12 o'clock.	8 P. M.	
Wheat flour lb. 2, Dholl lb. ½, Ghee 6 pice weight, With a little Saffron and Salt, Milk lb. 1.	Sathoo lb. 1, consisting of roasted chena and wheat flour with Sugar, Water, or Chena lb. 1, and water.	No Onions, No Tamarind, Mutton very seldom, and never eat fowl.

Rajpoot Officers.

12 o'clock.	8 P. M.	
Wheat flour lb. 1,	Rice lb. $\frac{1}{2}$,	Meat curry about 3 days in the week,
Dholl, oz. 8,	Milk lb. 1,	No Onions,
Sometimes Meat oz. 4,	Sugar oz. 4.	No Tamarind,
Vegetable 1 pice,		and never eat fowl.
Ghee 4 oz,		
Mussauls,		
Chillies,		
Saffron,		
Cummin seeds,		
Lime 1,		
Milk lb. 1.		

All the diets here noted are tolerably well suited to keep a man in health, except perhaps the Malabar dietary, which is very poor in quality. The Mahomedan and Rajpoot diets are well supplied with phosphatic matter while those of the Malabars and Gentoos are so deficient in materials capable of affording an adequate supply of earthy phosphates, that one might safely predicate, merely from an inspection of these tables, that those classes will be found to be most liable to fever.* In their diets every tissue but the osseous and nervous is supplied with a sufficiency of its appropriate constituents, and nutritive deposits are ensured to the skin, muscle, adipose tissue, &c., without a corresponding nutrition of the nervous substance. This daily addition to the general periphery of the body without a corresponding daily repair of the nervous tissue, increase of bulk without the attainment of proportionate nervous material, appears to me to be a common cause of ephemeral and intermittent fevers in the generality of Hindoos in the south of India.

The nervous system of those who eat rice to the exclusion of a more highly phosphatized diet is seldom capable of any sustained effort. Their skeletons are deficient in earthy matter, as is shown by the great frequency of lateral curvature of the spine among those who are subjected to medical examination for enlistment, and their blood

* Vide remarks at the end of this report.—A. L.

is poor in earthy phosphates, as is proved by the small amount of them to be found in the urine, at whatever period of the day it may be examined. The diet, however, may contain a sufficiency of phosphatic matter for all the requirements of the nervous and osseous systems, yet the phosphates may be rendered unavailable by the use of tamarind in the food, as earthy phosphates form very insoluble salts with tartaric acid unless the acid is in very great excess. The tamarind is a very good condiment for food rich in phosphatic and azotized matter, as the tartaric acid which it contains prevents the absorption of an excess of earthy salts and leads to increased excretion of nitrogenized materials from lungs, skin, kidneys and intestines; but it is for these reasons extremely prejudicial to the nutritive quality of the food of the poorer classes, however, useful it may be as a relish to their otherwise insipid meals.*

The loss of balance of which I speak may in some instances be occasioned by defective secretion. The occurrence of any check to the usual perspiration, any unusual slowness of the bowels, or depression of the respiratory power may lead to fever by rapidly increasing the bulk of the body, without any corresponding increase of nervous material in the blood, and with a decided diminution of nervous power, though it be more than ever required to keep the tissues and their fluid contents under vital control. As phosphates which have once formed an organized portion of the body pass off to a marked extent only by the urinary channel, while the other effete constituents are continually passing off by extensive surfaces, as the skin and bronchial and intestinal mucous membranes, more extensive, indeed, in proportion to the tissues whose *debris* they carry off than is the

* The diets are good specimens of what natives are partial to and take when they can obtain them. But it must be remembered that the majority of the lower classes of natives cannot afford the kinds, and quantities of food noted in these tables. In native regiments, at least ten per cent. of the men are so burdened with families, and more distant relations, that rice with some mussaul is nearly all they can obtain.

secreting surface of the kidneys to the cerebro-spinal substance, so a complete or partial arrest of secretion from the skin or bowels ensures at once a great preponderance of those tissues, especially of their fluid parts, which ought to be daily expended in order that what remains of them may be kept in proper proportion and subjection to the more permanent and less absorbable nervous substance. In this way exposure to a dry hot wind or to a sudden chill a few hours after a meal, when the effete matters of the old tissues ought to be coming to the surfaces in the form of secretion, will suddenly throw more responsibility on the nervous system than it is capable of incurring safely; and this increased demand upon it to keep up secretion against the check to which the secernents have been exposed without an adequate increase of nervous power to meet the necessity for increased vital control over the unusual bulk of the periphery, will lead to fever by leaving part of the chemical constituents of the body free from the government of the vital energy, and amenable only to chemical action with one another and with the surrounding atmosphere.

Or, again, the loss of balance may be occasioned by the deposition of an excess of phosphates with the urine; and the deposition may be the result simply of a separation at the kidneys of an excess of phosphates from the blood, as appears to be the case in confined damp atmospheres; or the phosphates may first of all be absorbed from the spinal cord, as sometimes happens after great bodily fatigue, or may be derived from the brain after the excitement and detrition occasioned by great mental application. In this country those who are liable to become our patients are little observant of the daily state of their urine, so that less is known of its peculiarities than of the changes in other excretions prior to the advent of fever; but I have occasionally met with cases where white deposits in the urine had been noticed several days before the commencement of fever; and, in some instances, medical attention has been first directed to these deposits from the person becoming alarmed

at what he has supposed to be purulent matter in the utensil, though he has been in fair health otherwise and not expecting to have fever. As these phosphatic deposits are frequently accompanied with a corresponding degree of general emaciation, fever does not always follow their appearance, though it does so often enough in well fed persons to permit us to view the loss of phosphates and the fever in the relation of cause and effect.

If the phosphates have once been carried off to any marked extent and not efficiently replaced, either by phosphatic medicine or a diet adequately supplied with phosphates, the person so suffering is very apt to have an attack of fever and is liable for years after to a recurrence of the same variety of fever if he exceed in his amount of eating what experience has taught him to consider compatible with health, or, in other words, avoidance of attacks of fever. Intermittent thus often leaves a person so liable to its recurrence that a single error in diet, one more than usually good meal, will lead in the course of twelve hours, or when sufficient time has elapsed to allow extra food to be turned into extra blood, to a sharp onset of the old type of fever, even after a quarter of a century has elapsed from the time of the first attack. When a man has once had an attack of the intermittent fever which is attended with red edged tongue and been treated with any preparation of cinchona he is, though apparently restored to health by the treatment, still left very liable to a return of the same form of fever, and hence it happens that a very moderate number of men furnish a very large number of cases to the hospital by their coming again and again upon the sick report. In a regimental hospital the constantly recurring return of the same individuals with the same kind of fever is often painfully annoying. The men are suspected of having become fond of the hospital, or, at least, disinclined for duty, and the medical attendant is apt either heedlessly to ascribe bad intentions to them or to grumble to himself, while all the while it is the course of prescription during their former

treatment which ought to be called in question and submitted to remark. They are purged and vomited to reduce the bulk of their reducible tissues and tone is imparted to their more permanent tissues by quinine; but when they leave the hospital their bulk increases steadily while the tonicity of their nervous system as steadily disappears, till the loss of balance between the nervous system and the other soft tissues is so decided that the least excess of food, or a check to the free action of the skin or bowels, necessitates a febrile or rather a chemical process as a substitute for that weak nervous control which was insufficient to keep the component parts of the body in correct vital relation to themselves. Something, therefore, remained to be attended to in these cases when we last had them in hospital and we have failed to perform it. We have reduced and cleaned out the machine, as we are well qualified for doing, and we have tempered the main spring a little better; but we have been blind to the fact that though tempering may impart strength it is a strength which cannot be lasting, as it is merely temporary strength from some variety of stimulation or tonification or some new arrangement of particles and not the true healthy and comparatively enduring strength which results only from a judiciously applied addition of fresh materials.

To return from our digression, however, there is yet, another way in which the nervous tissue, or rather I should say the blood on which it depends for its energy, may become deficient in phosphates. The air of damp close apartments too numerously inhabited is well known to those who have practised much among the poorer classes in England to be a common cause of great daily loss of phosphates by the urine. In this case the loss is usually followed sooner or later by fever of the remittent type, sometimes passing into intermittent, and phosphates continue to appear in the urine independently of mesenteric disease, though almost invariably followed sooner or later by derangement in that quarter. The air of jungles has the same effect on the

state of the urine. So has the air of all low lying land out of the free influence of the prevailing wind and covered with a steaming atmosphere, like that large extent of sunk ground behind the sand hills on the eastern coast, extending from the head of the Pulicat lake to near Vizagapatam. Nowhere perhaps are phosphatic deposits from the urine, even when it is not alkaline, more frequently observed than in our Northern Division and there are few parts of the country where intermittents and remittents are so common.

Apart from the fact itself that the earthy phosphates are passed off in excess by the kidneys when a person is living in damp close air, especially in the air of jungles or in the cultivated neighbourhood of marshes, we have some curious collateral evidence that the air of close damp places, abounding in living vegetation, must be highly favourable to the increase of urinary phosphatic secretion. The bones of tigers and other jungle animals become covered with exostoses after they have been some time in confinement as objects of exhibition. So far as I am aware, no explanation of the cause of this peculiar instance of the deposition of osseous matter upon bone has ever been offered. The animals are as well fed in confinement as they could have been in their native haunts. They have more constant exercise, from being kept in a constant state of excitation by the annoyance of their confinement, and this anxious nervous irritability of disposition is known to be highly favourable to the urinary excretion of earthy matter, from the depressing wear of the nervous system which accompanies that state, yet the phosphates are deposited abnormally within the body instead of being fully excreted. There must have been some agent operating on their system during their wild state to prevent this internal deposition by encouraging external elimination. On examining the skeletons of tigers in a museum we can tell at a glance which animal was killed in the forest and which died in captivity by the healthy smoothness of the bones in the one instance and their curiously rough encrusted appearance in the other.

What then is the essential and primary occasion of this marked difference? Other animals, whose natural place is the open plain, are little liable to these osseous formations seemingly because we do not bring them to an atmosphere their organization was not intended for when we reduce them to our service. While, however, the ox and the horse undergo no decided change of atmosphere in passing from the wild to the domestic state, the caged tiger is an instance of an animal suffering from an atmosphere which, though in reality purer than the air of its native woods, is no more suited for its lungs than is the cage for its idea of comfort. No air but the air of the forest will keep the functions of its lungs so in relation to its blood and kidneys as to enable the latter to eliminate any excess of phosphates from their circulation. In the jungle the feline tribe require to be possessed of high nervous energy, and it is ensured to them by the large quantities of condensed phosphates from the bone and muscle of their prey affording a constant supply of exciting material to their nervous system; but they obtain the phosphates to an amount which would be prejudicial to other parts of the body, after the requirements of the nervous and osseous systems are made good, were it not that the air they are intended to breathe induces a separation of the superfluous earthy matter from the circulating fluid, and finally from the body, through the agency of the kidneys.

It has often been noticed that those who have lived long in jungly and marshy situations and suffered from fever without showing any tendency to tubercle are almost certain to become affected with tubercles after their removal to a dry and airy open locality. This fact has often been disputed but has never been fairly controverted. As instances have fallen under my own observation, I am in favor of what appears to be the general belief on the subject, and I think it can only be explained by the fact that while the person was in the neighbourhood of the marsh, or jungle, the peculiar air of the situation, by its effect

on the circulation through the lungs, induced the deposit of an excess of phosphates by the kidneys, or so far prevented their assimilation, as to necessitate a constant febrile reduction of the other tissues to keep them, as already explained, in due relative bulk to the weakened nervous system; but that the better air, as it was erroneously supposed to be in this instance, to which the person was removed to enable him to get rid of the fever, having no power or property of affecting respiration, so as to induce phosphatic elimination and excretion, led to the blood depositing the earthy matter in weak organs liable to congestion.*

A similar change of respiratory and renal function to that already noticed as occurring in the tiger, when it is removed from the air of the jungle to what we erroneously consider a purer and more suitable atmosphere for all animals,

* It may at first sight appear very absurd to regard tubercle as an internal phosphatic deposit, but I have no hesitation in adopting this view, now that I have looked well to the matter. The most material difference between bone and old tubercle is that the one is organized and the other is not. The next important difference *connected with our present subject* is that while in bone the earthy carbonates and phosphates are united to gelatine formed directly by vascular action from chondrin, the same earths are deposited with a gelatinous medium (we cannot say dissolved in it). Neither need there be any difficulty in accounting for the formation of this gelatinous medium of the phosphates in tubercle. As we are endeavouring to show, the low state of the respiration in the confined air of a close room, or jungle, favors the deposit of an excess of earthy phosphates by the kidneys, and diminishes the azotized part of their excretion; while the better air of what are called healthy localities diminishes these urinary phosphates and increases the quantity of nitrogenous solids in the urine by the increased oxidating power of the lungs. If a patient be sent to a sea side station, after being some time subject to fever in an unhealthy district, the lungs and kidneys cannot at once regain their healthy relation of functions. The lungs form more urea and uric acid, but the kidneys are not at once adequate to pass them off, while the earthy phosphates which formerly were too readily separated are now detained in the blood. All this seems to be very far from my point; but as Liebeg has shown that gelatine may be produced by the addition, to the elements of Proteine, of water urea and uric acid[a] its formation in excess in the blood and its appearance as the agglutinating material of tubercular phosphatic deposits may not be so difficult to explain.

(a) Animal Chemistry by Justus Liebig, edited by W. Gregory, 1842, p. 143.

appears to take place in individuals who have in early life been subjeet to rachitis. Children who arc rachitic from passing a superabundance of earthy phosphates in their urine, when living in a elose damp unwholesome atmosphere, usually aequire in after-life a great increase of density in the skeleton, and in addition frequently become affected with tubercular deposit; though these arc rare in raehitie cascs owing to the free state of the kidneys in early life. This remarkable change from a great deficiency to a superabundance of phosphates in their tissues appears to be owing generally, to the increased care usually bestowed on the health of rachitie children: and to the animal diet upon which they are plaeed so soon as the extent of their ailment calls for medieal interferenee and direction, but is chiefly to be ascribed to the peculiar air of sea side localities, which are generally selected by the dictates of experience as being not only the most suitable for their residence, but also more to be relied on for their restoration to health than all the recipes in our pharmacopœas. The result of experience, rather than any correet rationale of the mode in which the change ensures a favorable turn to sueh cases, has proved the value of sea air in their treatment; a marked change for the better, and that almost immediately, generally follows the location by the sea side of a patient who has been passing urinary phosphates: unless the deposit of the phosphates have been oeeasioned by disease of the spinal cord or bladder; or their loss have resulted in the establishment of some organic disease or general breaking up of the constitution; and this change for the better consists essentially in the improvement in the functions of the lungs, as is proved by the amendment in the urine. There can be no clearer proof of the virtues and value of sea air in arresting the abnormal passing of earthy phosphates with the urine, than the fact long ago pointed out by my old friend Copland Hutchinson, that sea-faring people and dwellers on the coast enjoy peculiar immunity from calculous deposits.

What then is the essential difference between pure ordinary air and that in the neighbourhood of a marsh, or jungle, which may contribute to the latter the property of originating a chain of actions in the system, resulting in the separation of an excess of earthy phosphates from the blood by the kidneys? It cannot be the moisture of the air alone which affects the system, else those who live on the sea or near its margin would be similarly affected. Nor can it be gaseous effluvia from vegetable *debris,* because living plants are generally capable of consuming these exhalations as they are produced; and, if they did exist to any marked extent, owing to the crowded state of a jungle, exposure to their influence would be more immediately followed by headache, nausea, or some other well known effect of mephitic inhalation. The carbonic acid from vegetable expiration might be supposed, with some shadow of reason, to occasion the headache, lumbar pain and lassitude which usually mark the commencement of febrile attacks, as it is well known to induce such feelings when breathed in a very diluted form in our laboratories, were it not that the innervation consequent upon a deficiency of phosphates in the blood accounts more satisfactorily for these symptoms;* and that the same symptoms when produced by the inhalation of air containing a small proportion of carbonic acid, in ordinary localities, may and do continue for long periods without materially affecting the health, and especially without being followed immediately, or within a reasonable limit of time, by any kind of fever. Even long confinement to apartments which though badly ventilated are still not over-tenanted, though it may enfeeble the constitution, is not so often followed by fever as to induce us to regard carbonic acid and fever as a cause to an effect; though we must admit that it, in common with

* As the phosphatized constituents of the blood are peculiarly adapted for the stimulation of the brain and spinal chord, a diminution of these constituents is likely to be followed by lassitude and pain in some part of the nervous centres; in the same way that headache is sure to follow the withdrawal of any stimulant, to which the nervous system may have been for a time subjected.

many other exhalations in jungles and marshes, may be an important adjuvant in determining the peculiar type of the fever.

Heat and moisture in the air were long regarded as the primary causes of fevers in tropical climates; but they cannot be considered as the real originators of intermittents, since we are aware that this class of fevers can be developed in temperate and even in cold countries, provided there be only a moist atmosphere with some extent of vegetation. An elevated temperature is doubtless a great promoter of that peculiar quality of the air which induces fever, but cannot of itself give rise to a first attack of intermittent. The electricity with which moist air is more or less charged at all temperatures would seem to be more concerned in the formation of a fever—producing atmosphere than any of the agents we have named, as it is present wherever there is evaporation, and always in greatest quantity where heat and watery vapour combine to promote that great electrical agent vegetation. Both animals and vegetables are known to pass off electricity with the vapour from their surfaces, and the quantity developed is always in proportion to the extent of growth and evaporation. The air in the vicinity of large masses of vegetation or of animals crowded together must, therefore, be loaded with it and must effect some animals injuriously, as it is as much a law of nature that all animals cannot safely breath an atmosphere which is in the same electrical condition as their own surfaces, any more than they can all safely use air vitiated by their own gaseous exhalations. The electric fluid cannot certainly be considered as in itself a poison; but moist air may be so charged with it that the breathing organs of animals may not be able to get rid of the electricity which ought always to be passing from them, and may thus be unable to maintain their proper electric condition. In the hydro-electric machine, which lately attracted so much attention, it was found that the excitation of the boiler could not be brought to any great degree of intensity if the atmosphere around it was allowed to become

charged with the positive electricity of the vapour; and, as the vapour from the lungs in health is known to carry off large quantities of positive electricity, it is not likely the lungs can be kept in their right state of excitation, if they are acting in a medium already loaded with the same positive electricity produced by evaporation and vegetation. Hence, the air of jungles and marshes would appear to be prejudicial to the health of some animals, primarily by its inability to carry off the positive electricity generated in respiration, so rapidly as to keep up sufficient excitation at the respiratory surfaces.

Intermittent is not confined to the vicinity of jungles and marshes; but is also found in many other localities destitute of these great favorers of positive electric development. Sea shores strewed with pointed rocks and bare isolated rocky hills become positively electrified when heated by the sun's rays, and give out their electricity during the night to the surrounding air, when it has become cool and damp; so that those who sleep in such places are equally liable to fever as those who spend a night in a thick badly ventilated forest. Crowded ships in stormy weather, when the hatches are kept on and the air between decks is not renewed sufficiently often, sometimes furnish intermittent cases owing to the number of men in a confined space vitiating the air with their electrical as much as with their gaseous emanations; and these cases are often of a very severe kind like those which occurred many years ago in the channel fleet under Lord Howe.

Defective aëration of the blood, owing to this absence of electric stimulation, must lead to immediate changes in the functions of the secreting organs, as well as to increased bulk of the non-nervous soft tissues from partial arrest of secretion; so that loss of balance between the nervous substance and the other soft tissues may be brought about even where there is no actual disintegration of nerve matter, nor consequent loss of earthy phosphates. The connection between defective respiration and alterations

in the urine has not obtained the attention it deserves, although the functions of the respiratory surfaces and of the kidneys are most intimately related. It is now generally understood that the kidneys have no part in the formation of the urine, but merely eliminate it from the blood, into whose current its constituents are carried as fast as they are formed by the respiratory destruction of organized matter. The quality of the urine thus varies according to the degree of respiratory oxidation to which the constituents of the body are subjected. When the system is thoroughly oxygenated in health the animalized portion of the urine consists almost entirely of urea, with a very small proportion of uric acid; but when the aëration is less perfect the uric acid is increased in proportion as the urea is diminished. A lower degree of oxidation, such as we see brought about by want of action of the skin during the continuance of a common cold, eventuates in the formation of urate of ammonia. While in the fœtus where the respiratory surfaces have not begun to act, and in epidemic cholera where they have almost ceased to act, the urine is albuminous, the Malpighian bodies appearing to afford increased facilities for the transmission of unorganized products from the blood in proportion as the cells of the tubuli urineferi cease to eliminate the highly oxidized debris of the system. The albuminaria of cholera is doubtless partly the result of the congestion of the kidneys, and, therefore, partly independent of the congestion of the lungs or the want of respiration; but the albuminaria of newly born children cannot be ascribed to any turgescence of the renal veins. Nor do we expect to find the kidneys congested in every recent case of simple albuminaria in the adult, any more than we look for disease of the liver or kidneys in every case of diabetes mellitus, though we may be almost certain that in every case of albuminous or saccharine urine we shall find the skin to be very inactive and the respiratory murmur feeble or masked by submucous rales, even when we cannot find any decided evidence of organic disease. And, again, when the urine has been long albumin-

ous or saccharine, it sometimes suddenly ceases to contain either of these abnormal ingredients and has its usual urea and uric acid restored 36 or 24 hours before death, owing to the function of the lungs being all at once morbidly increased by irritation of the roots of the respiratory nerves, preceding effusion at the base of the brain. As the quality of the fluid passed by the kidneys is therefore as much influenced by the extent to which the lungs perform their functions as it has ever been proved to be by the state of the stomach or liver, it follows that the constituents of the body passed by the kidneys may vary according to the quality of the respired air. We know very well that they can be altered merely by change of air, since we find that young persons passing excess of earthy phosphates and very subject to remittent fever, as already noticed, from living in close damp apartments, vitiated by their own gaseous and electrical emanations, cease to pass any such excess when they are placed in opposite circumstances, and their lungs are stimulated by fresh air in any place, but more especially at sea bathing quarters where the air is rendered more stimulating from containing saline particles. The phosphates, however, are always more slowly replaced than any other constituents of the body, as every kind of diet does not contain them in quantity sufficient to replace any deficiency very quickly. So that if a person has lost phosphates, by being any time in an atmosphere highly electrized by either plants or animals, he will be long subject to fever unless the phosphatic loss be speedily made good. From three to ten days is the period which usually elapses between the time of passing through a jungle and the coming on of fever, or between the time of losing phosphates and acquiring a redundancy of other constituents liable to chemical changes if the blood has become in any way less suited for the requirements of that nervous system, which can alone, by its energy, keep their chemical tendencies in control. Those who have but little tendency to plethora, or are careful in their diet, may have a longer immunity from fever after being in a pre-

disposing atmosphere, just as we find in those who are subject to the constant recurrence of intermittent that it occurs at longer and longer intervals as their assimilating functions become feebler, either by the injurious effects of the fever on their constitution or by their advance in years. Some are sure to have an attack of their old fever when a trifling plethora follows a slight excess. Others again never have a visit from their old enemy till the rain season, or the setting in of the land wind, occasions a sudden plethora by diminishing perspiration. One man acquires in three days by virtue of good assimilating powers an amount of body which a feeble or badly stimulated nervous system cannot keep from chemical decomposition. Another makes blood more slowly and requires a fortnight or more to be fit to develope fever; while some would soon cease to have intermittent were it not that the moon's influence induces or adds to this plethoric condition.

Ever since intermittent fever has attracted medical attention endeavours have been unsuccessfully made to account for its regular recurrence after certain intervals. How far the phosphatic theory may assist us in the elucidation of the question, it is for the reader to determine.

First effects of loss of balance.—Increased bulk of the soft tissues of the body with the exception of fat, without a corresponding increase of nervous matter to keep it in vital control, is sure to result sooner or later in the conversion of the abnormal increase into effete matter; and, if no shock have been imparted to the nerve fibre by its presence, to its speedy separation and expulsion from the body, as we daily witness in copious sweats and movements of the bowels after excess of food and in the spontaneous perspirations and purgings which relieve the system in fevers, and which we endeavour to imitate in our treatment. In many severe cases of fever, which come under our notice, the effete matters which are passed off at the commencement of the treatment, or of the curative process set up by natural effort, appear never to have been properly vitalized: and the system seems to have

been suffering for days before the actual onset of the fever from the presence of this half vitalized or, as we may call it, half dead matter. The greater the accumulation of this effete matter in the system the more apt is the fever to take on a typhoid form, however simple it may be at its commencement; but as all fevers may take on this low form if the semivitalized matters which have led to the beginning of the fever prove too much to be thrown off at once by strong nervous influence, so it may be inferred that though many seemingly opposite circumstances give rise to fever, and we enumerate several seemingly distinct varieties, yet that the real immediate cause of fever is in every case the same, though the opening symptoms appear to be widely different, and every case would follow nearly the same course and terminate in a crisis either by stool, by perspiration, or by urine, and at nearly the same periods, were it not that the quantity of the semivitalized or effete matters thrown upon the nervous system, as well as the vital power of the nervous system itself in bearing up against the excess, varies as much in different cases as one individual differs from another in size or appetite or configuration or any other of his natural attributes.

However the loss of balance may be brought about, the result after a time is fever; or in other words, the result is the natural endeavour of the system to restore the balance in the only way it possibly can be restored without extraneous assistance, that is by the soft tissues entering into new and simpler combinations with one another or with the atmosphere, which every part of them speedily commences to effect when deprived in any way of the full vital control of the presiding nervous system. One leading feature in the chemical reaction at the commencement of fever, though not at the first of the commencement, is the absorption of oxygen by the lungs and skin, during the early stage, and the consequent slow burning off of the combustible constituents in order to bring the soft solids to their proper ratio to the nervous system,

so that when a sufficient reduction of the body has taken place in this way the nervous system is able once more to take the vital control of the tissues and assert its supremacy.

But, with some exceptions soon to be noticed, there is in every fever a stage preliminary to the hot stage or period, during which the body undergoes reduction by accelerated respiratory combustion. The hot stage is the period of oxidation, but before the hot stage, there is, strangely enough, as it at first seems, a cold stage or period of deoxidation. In the hot stage an excess of oxygen is drawn into the body, but in the cold stage oxygen is actually withdrawn from the greater part of the body. In the cold fit the abdomen is too warm, or at least of the natural temperature, while the skin and the air expelled in expiration are considerably below the natural temperature. In a well-marked cold stage, though the air appears to permeate every part of the lungs, and the chest yields clear sounds to percussion, the ear, even assisted by the stethoscope, fails to detect the respiratory murmur except over a small extent immediately below the clavicles. Inspiration and expiration are proceeding even faster than usual, but true respiration, or union at the pulmonary mucous surface of the carbon with the vivifying principle of the atmosphere, is in great part at a stand still. The lividity of the skin would lead us to infer there is pulmonary congestion, but this lividity is produced in reality by abdominal congestion and absence of true pulmonic respiration. The lungs sometimes become congested secondarily in the cold stage in very serious cases; but in the cases usually met with they are very poorly supplied with blood, which is during this period drawn into the abdomen by becoming venous and accumulated in the great venous receptacles. Now the blood being in these great venous repositories must be venous, as no property of holding or being intended to hold arterial blood has ever been imputed to them; and, as this great accumulation of blood

is venous, how has it become so. To reduce so large a bulk of blood to the venous quality, a large quantity above the proportion usual in health must have lost its arterial properties ; and, if so, how has an unusual proportion of the circulating fluid lost these properties. *Has it failed to acquire* these arterial properties by want of vital power at the moment in the lungs, or has it *lost* these properties in passing through the arteries of the abdomen. As the shivering, fulness in abdomen, and pain in one or both sides come on before any failure in the respiratory murmur can be detected with the stethoscope, I would say that the great bulk of venous blood in the abdomen has parted with its arterial properties in the arteries of the whole system, but more especially in the abdominal arteries, and that it has not primarily become venous from any decided want of power in the lungs to render it arterial; though we must admit the amount of their calorifiant work is diminished by the great temporary depletion they have undergone in consequence of the great temporary abdominal congestion.

Now, how has this great degree of abdominal congestion been brought about, or in other words, what has led to so great a loss of the oxygen of the arterial blood as to reduce so unusual a preponderance of it to venous? we must now call to mind what has been already advanced concerning the want of nervous power, either from the accumulation of tissues other than the nervous or from non-assimilation of the earthy phosphates or their actual loss prior to an attack of fever, and what has also been adduced concerning the liability of the constituents of the body to undergo chemical rather than vital changes when the nervous control is feeble, and we will not be slow to perceive that if the nervous control over the tissues be weak, and especially if the fluids of these tissues be superabundant, there will be an immediate tendency to the development of their chemical affinities. And as all the constituents of the body have, either combined or separately, a more powerful affinity for oxygen than they have for one another, the oxygen of the arterial

system will be rapidly withdrawn by these half vitalized or rather half dead matters, or portions of tissues which have already been spoken of as giving evidence of their accumulation before the access of fever; much arterial blood will necessarily become venous; and, as the chemical process of the oxidation of these half vitalized tissues at the expense of the oxygen of the arterial blood will be most decided in the abdomen, which is at all times the great store house for them, so the greatest formation of venous blood and its most marked congestion will take place in the abdomen also.

This then appears to be the deoxidizing process which gives rise to the cold stage of fevers. The oxygen of part of the arterial system appears to be absorbed by particles of the body which through the absence of adequate vital control are allowed to exert their chemical affinities to a degree which is unusual to the general healthy oxygenation of the system. A large proportion of the arterial blood is deprived of its oxygen and becomes venous, and is accordingly hurried into the venous reservoirs; and the fall of the temperature of the body results, in this way, not only from the actual withdrawal of the oxygen from the arterial system by the chemical attractions of these portions of the body deficient at the moment in nervous controlling power to hold them together; but from the abdominal congestion consequent upon the inordinate formation of venous blood in this manner from arterial, leading to a great reduction of the quantity of circulation through the lungs.*

Gradually, however, the demand for oxygen ceases; gradually the congested venous blood makes its way to the lungs, and gradually and steadily, as the venous blood comes to be reoxygenated in the pulmonary vessels, is the temperature of the system raised; and as the temperature resulting from pulmonic respiration is within certain limits in direct proportion to the quantity of venous blood which is being

* The deoxidizing power of organic matter while undergoing certain changes is well illustrated by yeast reducing the oxides of mercury to the metallic state.

aërated, so the heat and excitement and duration of the hot stage of the fever are exactly proportionate to the chill, depression and degree of congestion of the cold stage. Occasionally, as is well known, this reaction is never brought about, the deoxidizing process towards the central parts, and with it the formation and accumulation of venous blood in the abdominal veins and viscera, proceeding to such an extreme degree of congestion that blood is withheld from the lungs till death ensues from the whole system being deprived of oxygen; or, as more frequently happens, the blood returns so rapidly upon the lungs that the patient is suffocated by their being in turn congested during the first part of the stage of reaction. The ordinary termination, however, of the fever is the gradual development of a hot stage, and the termination of the hot stage in copious warm perspiration and watery exhalation from the lungs, from the union of oxygen and hydrogen resulting partly from the chemical deoxidation of arterial blood in the body during the cold stage, and partly from the subsequent additional pulmonary and cuticular respiration during the reaction. With this, and as a consequence of the increased exertion of the function of respiration, we have also an increase in the quantity of uric acid secreted by the kidneys, forming another evidence of the increased low oxidation and detrition of the tissues; and also in some cases profuse spontaneous bilious vomiting and purging terminating the hot stage, and bearing evidence to the extent of the primary deoxidizing process, and to the great necessity there has been for a critical and salutary throwing off of carbonized matters.

By this spontaneous reduction of the body in fever a complete removal of the fever is frequently, though slowly, effected; and it is found that the entire cessation of the febrile tendency is most speedily brought about in those cases which have had most accessions of fever in a given period. Instances of the kind are common to every medical man. In these cases the subsidence of the fever is effected by the febrile wasting of the reducible tissues, leading to the restora-

tion of the loss of balance which existed between the bulk of the soft tissues and the bulk or power of the nervous system, as I have endeavoured to explain in a former part of this paper. But it may be asked, how happens it that while the greater part of the bulk of the soft tissues of the body is being reduced during fever, the substance and power of the nervous system is not reduced also. The nervous tissue is always last to suffer reduction in all wasting diseases, and appears to preserve its texture and its power perfect and intact almost till the last period of life, unless the disease be attended with great determination of arterial blood to the brain so as to lead to early destructive oxidation of that organ. Ordinary cases of pulmonary phthisis and cases of starvation are instances in point; and in these delirium never appears till the emaciation has proceeded to a great degree and the brain has begun in its turn to undergo absorption.

Experimental physiology has proved that when emaciation is set up by any disease attended with febrile reduction or oxidation the fat goes first. This tissue, however, I do not consider has much connection with my subject, as it is a tissue in no way dependent on the nervous system; and, whether superabundant or deficient, has little, if any, modifying effect on tendency or otherwise to fever. The muscular and cellular tissues are next to be absorbed in emaciation, then the tendons and parenchyma of the viscera of organic life, and last of all the nervous substance. For this reason the mere induction of a certain degree of emaciation, the degree varying with the case, is sufficient to bring all the purely protein tissues under the control of the nervous system; or in other words, to give the nervous system a paramount preponderance over the rest of the organism. Practitioners know well that a spontaneous diarrhœa sometimes precedes the subsidence of every variety of fever, and cases of intermittent occur occasionally which defy all our most approved remedies and yet yield at length to the reducing effects of profuse colliquative discharges, the effect and the termination of a severe oxidizing process which leaves merely as

much of the body remaining as can be guaranteed by the vital force of the nervous system from any further febrile encroachment.

Our endeavours to restore a fever patient to health ought to be based, and, indeed, are based, on the spontaneous proceedings of the body in its attempts to rid itself of fever. We prescribe emetics, sudorifics and purgatives to bring the mass of the circulating fluids into better correspondence with the bulk of the nervous tissue. As the nervous system has been lowered in power by want of phosphates in the diet, or, as is sometimes likely to be the case, has the amount of its solids reduced by the passing off of the phosphates prior to the advent of the fever, we proceed to diminish the bulk of the other soft tissues and assist nature to re-establish the healthy ratio between these and the remaining power of the nervous fibre. Aware that the lowered or depressed nervous system is incapable of controlling the chemical actions of the usual mass of the body, we reduce the body till it be small enough to be fully pervaded by the remaining amount of nervous vital action; or, as the weakened presiding power cannot govern its kingdom without permitting intestine ferment and commotion, we take care the presiding power shall have the less to govern—no more, in fact, than it can fairly keep in subjection.

Or, we proceed in certain cases by increasing directly the nervous power itself by the administration of remedies which impart some peculiar principle to the nervous tissue and tend at the same time to prevent further disintegration. It is the opinion of Liebig and his followers that the good effects of quinine and other medicines of its class are owing to some constituent or elementary substance which is common to them and to the nervous system. "Indeed," says Liebig, "it cannot be considered merely accidental, that the composition of the most active remedies, namely, the vegetable alkaloids, cannot be shown to be related to that of any constituent of the body, except only the substance

of the nerves and brain."* And, again, "It is singular that we find medicinal agencies all depending on certain matters, which differ in composition; and if, by the introduction of a substance, certain abnormal conditions are rendered normal, it will be impossible to reject the opinion, that this phenomenon depends on a change in the composition of the constituents of the diseased organism, a change in which the elements of the remedy take a share; a share similar to that which the vegetable elements of food have taken in the formation of fat, of membranes, of the saliva, of the seminal fluid, &c. Their carbon, hydrogen or nitrogen, or whatever else belongs to their composition, are derived from the vegetable organism; and after all, the action and effects of quinine, morphia, and the vegetable poisons in general, are no hypothesis."† Long, however, before these views were promulgated most of the vegetable alkaloids had been found highly useful in fever, owing to their distinguishing property of heightening the power of the cerebro spinal system, and it seems remarkable that the analogy between the composition of some of our best vegetable antiperiodics and the composition of cerebric acid, one of the chief constituents of the brain, was not sooner looked to for an explanation of their remarkable powers over the organism. The great differences between the nervous substance and the other tissues of the body are, that the nervous substance contains oleo-phosphoric acid and cerebric acid which are not found in the rest of the tissues. The phosphorus in this phosphorized elaine is from $\frac{1}{20}$th to $\frac{1}{30}$th of the whole substance of the solids of the brain, while the cerebric acid, combined with soda, forms another essential part, though in what proportion has not, I believe, been as yet determined. According to the most recent views, the oleo-phosphoric acid must be supplied to the nervous system directly

* Liebig's Animal Chemistry, edited by William Gregory, M. D., &c. &c. 1842, p. 185.

† Idem. p. 188.

from the food, while the cerebric acid must be furnished indirectly by the choleic acid of the bile, as none of the ordinary constituents of our food at all resemble it in composition.

According to Fremy, whose analysis has superseded that of Vanquelin, cerebric acid consists in 100 parts of

Carbon, - - - - -	66·7
Hydrogen, - - - -	10·6
Nitrogen, - - - -	2·3
Oxygen, - - - - -	19·5
Phosphorus, - - - -	0·9

According to Dumas and Demarcay, choleic acid of bile consists of

Carbon, - - - - -	63·77
Hydrogen, - - - -	8·821
Nitrogen, - - - - -	3·255
Oxygen, - - - -	24·217

and according to Liebig quinine is composed of

Carbon, - - - - -	75·76
Hydrogen, - - - -	7·52
Nitrogen, - - - - -	8·11
Oxygen, - - - -	8·62

The analogies in composition are here sufficiently striking to incline us to the belief, that medicines of the quinine class are admirably adapted either to replace cerebric acid or to furnish the means for its ready formation, and we are therefore led to conclude that this class of medicines serves to arrest fever, partly at least, by supplying a principle in which the nervous system is at the moment deficient; but it can only be said that the vegetable alkaloids serve to arrest fevers *partly* by increasing cerebral nutrition, for there are differences in the proportional quantities of some of the constituents of cerebric acid and quinine, for example, which prove to us that they cannot, as a whole, be applied by the system to the requirements of the nervous substance; while

these differences enable us at the same time to throw some light on other important points in their febrifuge action. Quinine contains only half the proportion of oxygen contained in cerebric acid, while it contains four times as much nitrogen; so that while quinine as a whole is capable of contributing to the solids of the nervous matter, and thus imparting to the nerve texture greater vital controlling power over the other tissues of the body, it still affords an excess of nitrogen which cannot but be of essential service in preventing a further febrile reduction of tissues, by acting as an antagonist to their oxygen, the great promoter of the waste of the body during life, in health and disease, and of putrefaction after death, by its affinity for carbon and hydrogen. This antagonism of nitrogen to oxygen comes into effect to the immediate benefit of a fever patient, to whom bark or quinine is administered, long before the nervous tissue can receive any direct support from the alkaloid, and the oxidation of the tissues thus receives a chemical check, till the medicine can repair the nervous matter and afford to it such an increase of true vital power, as will enable it of itself to keep the chemistry of the non-cerebral tissues in proper vital subjection. This antiseptic property of bark and quinine has been little heeded of late years, though their primary febrifuge effects cannot be fully understood unless we give it due consideration. For this property it must ever, in all probability, remain unequalled in the treatment of all fevers where there may not be enough of vitality, to keep in subjection the chemical affinities of the tissues for their own and the surrounding oxygen, and where there is a decidedly septic tendency. Most of the alkaloids, from their containing a large proportion of nitrogen, are thus of more or less value in the treatment of fevers, and the value of each appears to depend very much on the relative proportions of nitrogen and oxygen. The greater the proportion of nitrogen the greater is the antiseptic and febrifuge power. Morphine contains double the per centage of nitrogen to what is contained in cerebric

acid; and opium, therefore, since the days of Trotter and Lind, has been found a first-rate febrifuge and antiperiodic, when given freely and early in the hot stage of intermittent, and owes its good qualities in these respects in all probability to its power of furnishing azotized matter to the nervous system; but, as morphine contains a great excess of oxygen, opium is worse than useless as an antiseptic, and may not be given where the vital power has become so weak as to permit the chemical affinities of the body's constituents to come into operation.

Or, if the case be assuming a grave form, the nervous power becoming much depressed, the secretions and excretions foul from the extent of chemical decomposition, and scanty from the want of nervous energy to move them to the surfaces and expel them from the body, we subject the patient to the influence of mercurial medicines. The salts of mercury alone in such a case will generally occasion dark watery offensive purging without being of service, but the reverse, to the patient; but if the mercury be given in very small and often repeated doses, or be so combined with other medicine that the now irritable spinal system may not be excited to pass it outward, we find after a time, which varies very much according to the depth of the typhoid stage, that very important changes are brought about. The pulse becomes decided and excited; there is more appearance of life about the patient and he moves his limbs more frequently, the secretions begin to be increased, as is first evidenced by the skin, and then copious expulsive movements of foul secretions take place which could only be occasioned by some new vigour communicated to the nervous centres through some improvement in the quality of the circulating fluid. Mercury of itself could not effect these wonderful changes, for mercury is not a constituent of the human body and has nothing in itself to make it capable of conferring power to a diseased body to imitate the vitality of health. It cannot then be from the mercurial salts employed in fever that we more immediately derive the wonderful accession of vital

energy which is expressed at the period they are seen to affect the system; but from some essential life sustaining agent being brought into circulation by their agency.

Now, as there is proof that the loss of the phosphates from the blood, or their being deficient owing to peculiarities in the diet, will lead to fever, so we have pretty clear proof that in those low fever cases which we seek to benefit by the constitutional effect of mercurials the benefit does not accrue to the patient, that is to say the spinal nervous system is not roused, nor does excretion and expulsory removal of the old debris of chemical decomposition occur, till the absent phosphates are returned to the current of the blood. If we have a typhoid fever patient with an old node on one of his shins, the slightest change in the surface of this phosphatic deposition will be the signal that the insoluble phosphates are about to be taken into the circulation and that the patient will soon be roused and the secretions and excretions be vigorously resumed. The poorer the blood may be in phosphates the worse will be the fever case, the greater will be the need of phosphates being drawn by the influence of mercurials into the sanguineous current, and the more decided will be the absorption of the spongy alveolar processes, and other loosely aggregated parts of bones, before any sign of improvement becomes apparent.

Mercurial preparations have two connected yet widely different actions, and unfortunately in some respects, we cannot keep these actions distinct and separate in practice. In ordinary states of the body, when all its constituents are in their normal proportions, mercurials at once encourage secretion by acting as general stimulants to the glandular surfaces; but when phosphates are deficient (as we may satisfy ourselves in any case by the urine) they have first to bring them from the fixed deposits into the general circulation before healthy secretion can be re-established.* Secretion in fact depends entirely upon the integrity of the constitution of the blood,

* Lancet, Vol. I. for 1845, p. 9.

and if any one constituent of that fluid be deficient the secreting organs cannot furnish their healthy products for want of the requisite material. But the earthy phosphates have a much more important part to perform than any of the other constituents of secretion, for not only do they enter freely into all the secretions, but the nervous matter which prompts and directs secretion is dependent upon them for the essentials of its highest development and vitality. So that phosphates are not only absolutely necessary to constitute an important element of the principal secretions, but are at the same time the prominent chemical feature in the constitution of the nervous system which has to govern the largest secreting bodies.

In protracted and obstinate cases we have recourse to arsenic, our most powerful remedy in constantly recurring intermittents. Where phosphorus is deficient, arsenic may be made to serve as its substitute or, as Sir Robert Kane has it, "the resemblance of function, so often alluded to, between arsenic and phosphorus is such, that the latter element, which characterizes the animal tissues by its almost constant presence, may be replaced as a constituent of our bodies by arsenic."* The preparations of this metal however are almost never required except in cases where there is a constant tendency to plethora and its utility appears to consist simply in the power it possesses of permanently lowering the assimilating functions. It cannot impart any superior vital quality to the system, except in so far as it may make up for deficiency of phosphorus, nor does it possess a power of bringing any necessary constituents of the body into circulation; but it so effectually lowers the powers of organic life, after a time, that the tendency to any undue increase of the volume of the blood is effectually arrested. No other medicine appears to possess in so remarkable a degree this power of lowering or even destroying the functions of assimilation and nutrition, and of arresting the development

* Elements of Chemistry by Sir Robert Kane, 2nd Edition, 1849, p. 512.

of the body, and the propriety of administering it, even in intermittents of long continued recurrence, ought always to receive very serious consideration. The vital power is always tolerably good so long as the body can develope a well marked intermittent, shaken and broken though the constitution may appear in cases of long duration, and we should be slow in exhibiting a remedy whose most marked effect is that of reducing the organic functions to so low a vitality that they are for a time or, it may be, forever, unfitted for ministering to vascular repletion. Arsenic has been found of great value in skin diseases, partly from its acting as a substitute for phosphorous,* and partly from its property of diminishing the assimilating activity of the intestinal surfaces, so that they take up no more nutriment than can be readily turned to healthy account by other organs; and it may be found hereafter, on this account, a valuable medicine for the prevention of plethora in individuals who are threatened from time to time with apoplectic and hemoptytic attacks, from the constant recurrence of this plethoric state; but we must consider it inadmissible for keeping down the bulk of the body in those who have a constant tendency to intermittents, if we can bring ourselves to believe that our philosophic course of proceeding in the treatment of these harassing periodic fevers is not to reduce the body generally and permanently, so much as to communicate a permanent power and tone to the nervous system, that it may be capable of preserving any bulk of body in uninterrupted and harmonious action.†

* An interesting paper on the value of phosphate of lime in certain leprous affections was read to the Medical Society of Kamptee, 10th October, 1849, by Assistant Surgeon Tribe, who brought before the Meeting a Cavalry Sepoy who had recovered under its employment.

† In advancing this opinion I am at the same time well aware of the great value of the white oxide of arsenic in strengthening the nervous system when judiciously administered. But, when given in sufficient quantity to replace absent phosphates, and long enough to eradicate an obstinate intermittent, I am convinced it diminishes the absorption of chyle, from the peculiar character of the intestinal evacuations during its exhibition and long after we have ceased to exhibit it, if we have been obliged to continue it for a considerable period.

Or, last of all our instances, we may set free, phosphoric acid in the blood, and so make it more available for cerebral nutrition, by administering some acid, as the sulphuric, having a greater affinity for the bases of the phosphatic salts. Liebig shows in his letters, that this arrangement must certainly follow the absorption of diluted sulphuric acid, though he does not appear to perceive the importance of a knowledge of this fact in the treatment of fever. Both sulphuric acid

The following accurate description of the effects of the white oxide of arsenic primarily on the secretions and excretions, and secondarily on the cerebro-spinal system, especially on the nerves allotted to respiration, renders my view of its action more than probable, though the writer has unfortunately failed to notice its *ultimate* effects on assimilation.

"The appetite and thirst are moderately increased, the secretion of urine becomes more abundant, and *the evacuations from the intestines often more frequent, and of a pulpy or pappy character.* From the intestinal canal the peculiar action propagates itself over the whole system. The heat of the surface is augmented, and the increased temperature is experienced particularly about the forehead and eyebrows, and the skin is bedewed with a bathing perspiration. At the same time an increased strength and frequency of pulse is felt. The whole muscular system acquires energy and elasticity; the involuntary muscles especially become more powerful and vigorous in their action; the respiration is gently accelerated. The nervous system partakes of the impulse communicated to the frame, and the spirits as well as the courage of the individual rise, liveliness and regularity characterizing the whole functions of the system."—*Penny Cyclopedia, article "Arsenic."*

This description would apply almost equally well to the effects of phosphate of lime, except that the stools during a course of the phosphate appear to be more the results of excretion than of non-assimilation, such as is indicated by the frequency and pappy peculiarity noticed in the quotation; and that the frequency of the pulse is diminished, and often remarkably, by phosphate of lime, while its strength is just as much improved by it as by arsenic. Healthy secretion cannot proceed while the pulse is frequent, and medicines which steadily lower the frequency of the pulse and impart greater power to it, by first of all increasing the energy of the cerebro spinal system, are the great essentials in the treatment of all fevers but the inflammatory.

The author of the article on arsenic already quoted speaks of its effects on the kidneys as preceding its effects on innervation and respiration. My own observations, however, would lead me to believe that the nervous system is first affected by arsenic in the circulation, next the pulmonary and cutaneous respiratory functions, and then the function of urinification, simply because the work of the lungs is according to the power of the nervous system, and the performances of the kidneys are, in great part, merely indices of the state of the respiration, that is to say while there is no organic lesion.

and the sulphates, which have, like sulphate of zinc or copper, no disposition to excite expulsory actions when given in moderate doses, may be made useful allies for the temporary arrest of intermittent. The persesquinitrate of iron most probably acts upon the same principle; though we must not lose sight of the importance of the iron to a patient who has become pallid from the long continuance of ague.

If it be true, as has been proved by chemical analysis, that the circulating earthy phosphates are increased in amount when the system is brought moderately under the influence of mercurials;* and if we find, as is really the case, that periodic fever ceases for a time when mercurial action has been fairly established, and proved by free salivary secretion, we may safely, I think, conclude that the cessation of the fever is due to the effects of the increased amount of phosphates absorbed from the osseous textures and set free for the repair of the nervous system. It may be objected to this view that the well known action of mercury as a stimulant is sufficient to account for the cessation of the febrile symptoms, as we know that stimulants in general are antiperiodics, and are powerful in proportion to the permanency of their effect on the constitution; but it must be remembered that the cases in which mercury most decidedly shows its stimulating effects by quickening the pulse and respiration, and rendering the person nervously excitable, are the very cases where its febrifuge effects are least observable. In these cases, moreover, we have great soreness and swelling of the mouth with little or perhaps no secretion, even when the mercury has been pushed to the limits of safety, which would lead us to conclude that the elements necessary for the salivary secretion, viz., the phosphates of soda, lime, magnesia, and phosphate of the peroxide of iron, with chlo-

* By salivation, the phosphates are nearly doubled in the blood, and are more than doubled in the urine; while the fibrin is decreased one-third, and the albumen one-tenth.

ride of sodium and sulphate of soda, are not at the moment in the blood, and, therefore, not ready for the repair or nutrition of the nervous system, which is in great part composed of them. We find also that when the morbid stimulating effects of mercury are at their height and no impression made upon the fever, we can lower the pulse, produce free salivary secretion, and dissipate the fever merely by the direct exhibition of these phosphates in the form of bone powder; and this is, I think, a tolerably good proof that the febrifuge effect of the mercurials is not occasioned by their stimulating action, but is owing almost entirely to the phosphates which they cause to be absorbed from those great phosphatic store-houses, the bones, and brought into circulation for the benefit of the cerebro spinal system.

If we admit, then, that the leading effect of alterative doses of mercurials in fever is the bringing of phosphates into circulation for the nutrition of the nervous system, so as to impart to it greater power of preventing the febrile oxidizement of the rest of the body, we may, perhaps, independently of all practical proof, be led to believe that in many cases of fever, where mercury is not specially called for as a stimulant to the dormant energies of the cells, the direct exhibition of the phosphates alone would be sufficient to serve our purpose of restoring the patient to health. But, if in addition to these hopeful anticipations afforded by theoretic induction, we find that the phosphates, as they exist in the bones, have actually the power of permanently arresting fever, when introduced into the system in a form to be retained in it, we must surely yield to the inductive reasoning and the practical proof together and acknowledge that earthy phosphates are really of no mean value in intermittent fever.

Though we can always bring phosphates into circulation by the action of mercury, and thus bring them to bear on the nervous system so as to eradicate an ordinary periodic fever, we cannot keep these phosphates for any time in the blood, as they are daily passed off by the secreting organs, and the body

may be thus in time almost cleared of available earthy salts. Intermittent cured by mercury is almost sure to return in an aggravated form, because though we have for a time enriched the blood with phosphates they are soon excreted or sink again into the osseous textures, from which they were taken up by the absorbents, and the blood is more impoverished than it was before we undertook the treatment of the case. This objection cannot apply to the direct administration of earthy phosphates, for if the blood be ill supplied with them, owing to their being deficient in the diet, or passed off in too great quantity by the kidneys, or used up for the requirements of pregnancy, or lost by adding to the density of the skeleton as we advance in life, there is every inducement to urge us to give the phosphates themselves in accordance with the exigencies and in obedience to the requirements of the body. By bringing the phosphates into circulation by absorbent medicines, we certainly effect a great and immediate temporary good; but the benefit is soon followed in many cases, among the poor at least, by a serious and lasting injury to the constitution, which might be avoided by simply prescribing the phosphates themselves.

In giving phosphates, our first care must be to stimulate the respiratory surfaces so that there may be no risk of their being passed off as fast as they are taken up. We can but seldom remove our patients to the stimulating air of the sea side, so that we must find a medicine which will have a somewhat similar effect on the pulmonary mucous membrane. Sugar has recently been proposed for this purpose by a French physician, whose views must be already known to the profession by the notice of them which appeared in a recent No. of the Lancet (about June or July 1850, I think); but it does not seem well adapted for this country where we find saccharine very often alternating with neutral or slightly acid phosphatic urine.* Sulphur will here be found to serve the purpose, if given in small doses to ensure its entrance into the

* But not with Ammoniaco Magnesian phosphate.

system and the conversion of part of it into sulphurous acid in the lungs. It will be found of great service in small frequently repeated doses in *beriberi* cases, with phosphatic and alkaline urine, as it acts more efficiently than the largest doses of mineral acids. Indeed it acts so efficiently in such cases that we must ascribe its virtues more to some effect it has upon the functions of certain organs, than to any neutralizing power the small amount of acid formed from it can exert upon the urine. In these cases the peculiar blueness of the gums and inside of the cheeks is but an indication of a somewhat similar state of the bronchial lining membrane, as is confirmed by the feebleness of the vesicular murmur, and we have to find a medicine which will ameliorate these symptoms before we can hope to prevent the kidneys passing excess of phosphates in true *beriberi* cases.

As to the best mode of administering phosphates in intermittent fever, I cannot do better than introduce in this place, with a few additions, the directions written by me some time ago and issued by the Medical Board, and then conclude with a few cases illustrative of the treatment; premising, however, that though I recommend phosphate of lime and sulphur only in fever cases where the tongue is red edged, still that cases occur with pale edged tongues which are benefited by this remedy, when they have continued to recur in spite of bark and quinine. Cases running into *beriberi* are instances of the kind. Where, however, the paleness of the tongue is accompanied with splenic enlargement this remedy will not be found of much service, unless given alternately with quinine.

1. Phosphate of lime (impure) is most easily prepared by calcining sheep's bones. It is then to be finely powdered and well mixed with one-sixth of its weight of sublimed sulphur. Washed sulphur is to be preferred.

2. This compound powder of phosphate of lime with sulphur may be given with advantage in most cases of well marked intermittent fever, and in any of its stages. If em-

ployed, it must constitute the basis of the treatment, and other medicines, when required, must be held as auxiliary to it.

3. When this powder is to be employed, emetics may be considered unnecessary, unless the tongue be unusually foul, or the conjunctiva decidedly yellow. A purgative of compound powder of jalap with calomel, or a pill of croton powder with calomel, should be given at the commencement of the treatment, unless the fever be present, or be expected to come on within a few hours, at the time the patient is first seen.

4. If the fever be expected soon, or be present in any stage when the patient is first seen, a dose of the powder ought to be given at once and the exhibition of the purgative delayed till next morning.

5. The dose of phosphate of lime with sulphur is two drachms, thrice a day, in treacle or sugar and water. It should be continued steadily till the usual period for the expected fever has passed without any febrile return. Four drachms may be given at the first if the patient be very weak when first seen, or if there be any urgent necessity for at once cutting short the fever. Half a drachm thrice a day, is considered a suitable dose between the ages of two and five; one drachm from five to twelve, and after that age two drachms, thrice a day.

Patients under 20 years of age recover more slowly on this medicine than those above 20.

6. This remedy acts moderately on the bowels, usually producing two stools per day; sometimes it seems to be very rapidly absorbed, and therefore acts very slightly on the bowels. It removes thirst and improves the secretions. The skin becomes steadily moist under its influence; and if the powder be given at the commencement of an attack of fever, headache is either altogether prevented or materially diminished, and perspiration is usually rapidly induced and pro-

moted by it. The patient also appears to lose the sense of prostration sooner on this than any other remedy.

7. The bowels are usually kept sufficiently open by this combination; but, if the tongue be foul after three days treatment, or the skin be too warm at all times and clammy, a smart purgative should be given, or muriatic or nitro-muriatic aeid (in doses of from one drachm to two drachms, in five or six ounces of water) should be given with the morning dose of the powder, and repeated as often as the foulness of the tongue may indieate the need of it.

8. When the conjunctiva is yellowish, or there are any signs of congestion remaining between the attacks of fever, two or more grains of calomel should be given with each dose of the powder. Or a smart dose of ealomel may be given with the last dose of phosphate of lime and sulphur at night, and a nitro muriatic aeid draught with the first dose in the morning. Mineral aeids, however, eannot always be procured; but any common purgative does sufficiently well in the morning, if given alone. When the tongue begins to elean, infusion of gentian or infusion of ehereyta is of serviee as an auxiliary to the powder; and exercise should be permitted or recommended as early as possible.

9. Leeching and blistering must be used, of course, as they may be deemed necessary; but in my experience in the use of this remedy unusually few oecasions have been found for the employment of leeches and blisters when this powder has been employed early and given steadily. When, however, any symptoms arise, to indicate the need of depletion in the eourse of intermittent, in which this powder may constitute the basis of the treatment, the patient, if a native, will be found to bear leeching or venesection better than is usual with natives, especially with Hindoos.

10. The cases most suitable for the remedy are well marked intermittents, where the tongue is either elean or very red, or foul with red edges, or raw and patehy, or has the pale boiled appearance usual in *beriberi*. The more

indeed, the tongue, pulse, feelings, and general appearance, indicate the transition of the case from intermittent to *beri-beri*, the more necessity there is for giving this powder and persevering in its administration, as it seems to be of peculiar value in cases of long standing intermittents, threatening to terminate in paralytic, or dropsical appearances.

11. The only symptoms which contra-indicate the employment of phosphate of lime with sulphur are the changing of the tongue from the characters above enumerated, its acquiring a white shaggy or villous coating, and the fever appearing to be taking on the remittent form. Under these circumstances the powder ought to be at once intermitted, and quinine given till the tongue lose the shaggy coating.

12. As a general rule the patient ought to be restricted to low diet till he be fairly rid of the fever. When the pulse is feeble, between the attacks, chicken or mutton broth, or beef soup, ought to be allowed. Onions ought to be in the soup as their juice assists in the solution of the medicine, The use of tamarinds, as well as all preparations of tartrates, must be strictly forbidden, as they render the phosphate of lime insoluble. Garlic ought to be prohibited as it invariably keeps up febrile action.

Cases of Intermittent Fever treated with Phosphate of Lime and Sulphur.

Intermittent Fever.

P. Kristnamah, aged 24, 2d Dresser, No. 199.

18th April, 7 A. M.—Shivered about 6 o'clock yesterday morning, and had severe fever with frontal headache nearly all day. Took a croton and calomel pill in the morning; was well purged. Took phosphate of lime $1\frac{1}{2}$ drs. with sulphur $\frac{1}{2}$ dr. at 4 P. M., and began to perspire copiously at 5 P. M. At 7 P. M. the pulse was 100. Took another dose

of phosphate at 8 P. M., and perspired freely during the night. Pulse now 100 soft, full, much soft cough with copious expectoration, skin cool and wet, bowels open, no pain in any place but the forehead.

Calomel 4 grs. now.
Superphosphate of lime 3 drs. at 11 A. M.

19*th.*—Was obliged to attend to his duties yesterday, notwithstanding his debility, so that his improvement has been somewhat retarded; pulse 90 soft, looks clear, skin cool, cough easy and expectoration of clear mucus copious, tongue nearly normal, bowels open.

No medicine.
Chicken broth.

20*th.*—Is much disturbed by the constant moist cough which is also keeping up the pulse. Bowels open, no return of fever.

Cough Mixture.

21*st.*—Less cough, no fever, bowels open, pulse and tongue nearly normal.

Cont. mixture.
Phosph. of lime 50 grs.
Sulphur 10 grs. M. now.

22*d.*—No fever, pulse 80. No complaint but of cough.

24*th.*—No return of fever, cough nearly gone.—Discharged.

Tertian Intermittent Fever.

Duniah, Private, aged 20, No. 1674.

10*th March*, 1849.—Admitted. Fever comes on every 3d day about 2 P. M. Complains now of pain in head and limbs. Tongue rough, red-edged, bowels slow, had fever yesterday.

Compound powder of jalap 1 dr.
Calomel 4 gr. M. now.

11*th.*—Well purged, free from uneasiness, pulse 64, tongue red-edged.—Nothing.

12*th.*—Fever came on at 4 P. M. yesterday. He shivered and became hot; but did not perspire. Bowels freely moved, pulse 64, soft, tongue foul, very red at edges.

Phosph. of lime 50 grs.
Sulphur 10 grs.
Calomel 4 grs. M.—each night.

14*th.*—No return of fever, health good.—Discharged.

QUOTIDIAN INTERMITTENT FEVER.

Ramdeen, Private, aged 40, No. 508.

31*st July,* 1849, 7 P. M.—Admitted, had a slight attack of fever 5 days ago, but did not come to hospital. Shivered yesterday at 2 P. M., and had smart fever till the middle of the night, when it went off without perspiration; but the bowels moved twice spontaneously instead. Tongue foul, yellow with red-edges, pulse 100 soft full, skin dry and too warm. No headache, but has pains all over body, especially in loins.

Common emetic, now.
Phosph. of lime 3 drs.
Sulphur 1 dr. M. at 10 A. M.

1*st August.*—Had free vomiting and purging. No fever yesterday, but thinks he had fever about 11 P. M. Tongue nearly clean, red at tip, but pale at edges. Pulse 80, rather weak, skin cool but too dry. No pain any where. Repeat phosphate of lime and sulphur.

2*d.*—Had fever preceded by smart shivering for an hour yesterday afternoon. Tongue now thickly coated, with narrow red line at edges. Bowels moved three times yesterday, pulse 90, soft, full, skin too warm and clammy.

Compound powder of jalap 1 dr.
Calomel 5 grs. M. now.

3d.—No more fever, bowels moved four times. Tongue still foul and red-edged, pulse 80, soft, skin cool. Repeat phosphate of lime and sulphur now.

4th.—Improving, no return of fever. Continued phosph. and sulphur.

5th.—No return of fever. Pulse and skin normal, though he has been out of hospital, washing and eating at his own pleasure. Tongue still white and rather red-edged. Bowels open.

Phosph. of lime 1 dr.
Carbonate of potass ½ dr. M. now.

6th.—Tongue clean, health good.—Discharged.

Intermittent Fever.

Shaik Booran, Private, aged 30, General No. 635.

21*st April* 1849, 7 A. M.—Admitted last night with fever which commenced with shivering at 11 A. M., yesterday, and went off without distinct perspiration at 4 P. M. His tongue was dry and he had much thirst. Had an emetic last night which acted both ways freely. Pulse now 100, soft, weak, skin cool. Respirations 40 per minute, irregular, partly abdominal; chest sounds well and the respiratory murmur is distinct throughout, except at lower part of right lung where it is rather dull. Is very weak but free from pain.

Phosph. of lime 2 drs.
Sulphur ½ dr. M.

21*st.*—Complains of intense headache and seems almost beside himself from it, pulse 100 weak, tongue dry, bowels not moved since yesterday.

Compound powder of jalap 1 dr.
Calomel gr. 4 M. now.
Blister to each side of head.

23*d*.—Purgative and blister acted well; pulse 80 of better strength. No headache, tongue inclined to be dry.

Phosph. of lime 50 grs.
Sulphur 10 grs. M. twice a day.

24*th*.—Looks well, though the tongue is again dry and now brown, pulse 80 soft, blisters open, bowels very slow. Repeat the purgative powder. Continue the fever powders.

25*th*.—Improving. Continue phosph. of lime and sulphur.

28*th*.—Gaining strength. Nothing.

3*d May*.—Well in every respect though the tongue is still inclined to be dry. The skin and bowels secrete well. Repeated the last powders.

11*th*.—Strong and healthy.—Discharged.

This man had the tongue peculiar to sepoys who take too much garlic.

Intermittent Fever.

Mootoosawmy, Private, aged 30, General No. 715.

31*st July*, 1849, 7 A. M.—Had fever yesterday evening preceded by shivering at 4 P. M. Began to perspire at 11 P. M. Pulse now 80, soft weak, skin cool, looks heavy, eyes turbid, tongue coated yellow, red-edged, bowels moved once this morning. Has not taken medicine.

Common emetic now.
Phosph. of lime, 3 drs.
Sulphur 1 dr. M. at 10 A. M.

1*st August*.—Had free vomiting and purging, no return of fever, tongue clean, eyes clear, pulse 80, soft.

Phosph. of lime 3 drs.

2*d*.—No return of fever, pulse, tongue, skin and bowels normal.

3*d.*—No return of fever; well, but says he is rather weak, pulse 68.—Nothing.

4*th.*—Pulse very slow, quite well.—Discharged.

The five following cases were men who had been 10 days on duty at Seetabuldee, and were taken with fever from three to five days after their return. These cases were well marked.

Intermittent Fever.

Private, Govindoo, aged 28, General No. 1075.

Admitted 2d November, 8 A. M. with intermittent fever.

4*th.*—Has had one croton pill and several drachms of fever powder since admission, had fever yesterday afternoon.

Continue fever powder, 2 drs., twice a day.

5*th*, 2 P. M.—Tongue red-edged, pulse 120. Is in copious hot sweat, no pains, has been dieting imprudently.

Continue phosph. of lime and sulphur.

6*th.*—Looks well; tongue and pulse normal, except a small red triangle at tip of tongue, bowels moved twice yesterday evening and once this morning.

Continue phosph. of lime and sulphur, twice a day.

7*th.*—No fever yesterday, tongue red-edged and at tip, pulse normal, skin cool, bowels moved this morning.

Continue fever powder.

9*th.*—No fever since last report, tongue still a little red at tip, bowels open, pulse and skin normal.

Continue fever powder.

10*th.*—Quite well, though there is still slight redness at tip of tongue.—Discharged.

Quotidian Intermittent Fever.

Private, Soobroyen, aged 30, General No. 1112.

5th November, 1849.—Admitted at 2 P. M., in the sweating stage of intermittent: was discharged this morning, having been two days detained in hospital without any fever coming on. Began to shiver at 10 A. M., tongue now very red-edged and foul at centre, bowels slow.

Phosph. of lime 3 drs.
Sulphur ½ dr. M. now.

6th.—Tongue white and red spotted in centre, very red at edges, pulse and skin normal; bowels moved twice yesterday and to-day once.

Continue phosph. of lime with sulphur, 2 drs. twice a day.

1½ P. M.—Fever on now, pulse 100, soft full, tongue red, clean.

7th.—Tongue pale, rather red at tip, pulse normal, bowels moved once this morning.

Continue fever powder.

8th.—No fever yesterday, pulse, tongue and skin normal, bowels open to-day.

Continue fever powder.

9th.—No fever, tongue, pulse and skin normal. Discharged.

Quotidian Intermittent Fever.

Private, Shaik Hoossain, aged 30, General No. 1196.

5th November, 1849, 2 P. M.—Admitted in the sweating stage, began to shiver at 9 A. M. Tongue very red-edged, foul in centre, has severe pain in back and head.

Phosph. of lime 3 drs.
Sulphur ½ dr. M. now.

6th.—Pulse of normal number but too full, coughs a little,

skin temperate, tongue very red-edged and foul at centre, no stool.

Sulphate of magnesia 1 oz. now.
Continue phosph. of lime.

1½ P. M.—No fever.

7th.—Tongue slightly red at tip, bowels freely moved, skin rather warm and dry.

Continue fever powder.

6 P. M. Says he had shivering at 10 A. M., pulse now 100, skin too warm.

8th.—Tongue still too red at edges, clean; pulse and skin normal; bowels moved last night.

Continue fever powder.

9th.—No fever for two days, tongue a little too red, bowels open, pulse and skin normal.

Continue fever powder.

10th.—No fever, pulse and skin normal, tongue still a little red at edges, bowels open.

Continue fever powder.

11th.—Pulse slow, skin too warm and dry, tongue foul rather red at tip and edges, looks heavy.

Pulv. jalap compound 1 dr.
Calomel 4 grs. M. now.

13th.—Was well purged, tongue, pulse and skin normal, no return of fever. Discharged.

Quotidian Intermittent Fever.

Private, Syed Hoossain, aged 28, General No. 1833.

5th November, 2 P. M.—Admitted in the hot stage, began to shiver at 11 A. M. Tongue very red and foul at centre, pulse 120, no headache.

Phosph. of lime 3 drs.
Sulphur ½ dr. M. now.

6th.—Tongue very red-edged and foul, pulse normal, skin too warm and clammy, no stool.

Sulphate of magnesia ½ oz. now.
Continue phosph. of lime.

7th.—Says he had fever last night at 12, but there is no trace of it, had one ounce of fever powder yesterday, tongue has still very slight redness at tip, pulse 80 soft, skin cool and dry, bowels moved four times.

Continue phosphate of lime.

8th.—No fever yesterday, though he had a little heat of skin in the afternoon which he called fever, though not preceded by shivering. Tongue very slightly red-edged and clean now at centre, bowels open to-day, pulse normal, slight cough.

Continue fever powder.

9th.—Skin was rather warm last night but he had no fit of fever, tongue pale, pulse and skin normal.

Continue fever powder.
To take exercise morning and evening.

10th.—No fever, tongue free from redness and clean in centre, pulse and skin normal.—Discharged.

Quotidian Intermittent Fever.

Private Chickanah, aged 33, General No. 1538.

5th November.—Admitted 8 A. M., was detained yesterday and had fever, commencing with shivering at 8 A. M.; had croton pill, and phosphate of lime, 4 drs.

2 P. M.—Shivering came on at 10 A. M., to-day but he must have had very slight fever as the skin is now cool and dry. Had a dose of phosphate of lime with sulphur this morning, tongue now clean but rather red, pulse 88 of good strength, bowels moved this morning.

6th A. M.—Has just had a shiver, and vomited a large quantity of bile as he was becoming warm, pulse 140 soft, weak, skin moderately warm, no pain any where. To drink warm water and to have sulphate of magnesia one ounce when the sickness goes off.

Continue phosph. of lime.

1½ P. M.—Fever still on, tongue paler, pulse 120, skin warm and moist.

7th.—Tongue still red at edges, is free from fever, skin cool and moist, pulse normal, bowels moved freely.

Continue fever paste.

9th.—No return of fever, tongue still rather red-edged and marked by the teeth.

Continue fever paste.

10th.—Pulse rather quick, tongue a little red-edged, no return of fever, complains of weakness.

Continue fever powder; mutton diet.

11th.—Bowels freely open, skin moist, warm, tongue nearly normal, pulse normal, says he had fever yesterday with a cold fit; but the dresser saw him and there was no cold fit.

12th.—Quite well.—Discharged.

INTERMITTENT QUOTIDIAN FEVER, RUNNING INTO BERIBERI.

Seevacharum, Private, aged 25, General No. 1624.

3*d May*, 1849, 7 A. M.—Admitted. Is ghastly yellow, eyes unnaturally large, rather yellow, tongue very pale, slightly furred, skin cool, much thirst. Pulse 140 weak, incessant dry cough, coughs up clear mucus copiously at times, much giddiness, no pain nor uneasiness any where; walks pretty steadily, no numbness nor œdema of hands and feet, chest yields clear sounds; but the heart's action is very feeble,

though its bulk is normal and well defined to percussion. Bowels move regularly, passes plenty of urine, stools and urine not seen. Has had fever several days, it comes on every day about 2 P. M., and he perspires copiously about 8 P. M. Has very much the appearance of a beriberi patient, has never been in hospital.

Blister to each temple.
Phosph. of lime 2 drs.
Sulphur 40 gr. M.

to be taken now; mutton, dhal and coarse wheat bread for diet; rice and tamarind to be forbidden.

4th.—Pulse 100 soft, weak, tongue now red and moist, no stool, urine copious, red; blisters acted well, no giddiness now, no fever yesterday, skin only ordinarily moist last night, eyes still rather yellow but countenance improved.

Continue the fever powder and diet as above; castor oil one oz. now, that the character of the excretions may be ascertained.

5*th.*—Stools of good colour and natural odour, pulse 100 soft, tongue paler, urine scanty red.—Continue.

6*th.*—Passed about a quart of dark red urine in last 24 hours, pulse 82 soft, no stool, no return of fever, well in every respect.

Comp. p. of jalap one drachm.
Calomel 5 grs. M.
to be taken now.
Omit phosph. of lime and sulphur.

7*th.*—Bowels moved freely, urine copious but not seen, eyes nearly natural, pulse 68 soft; lungs seem a little congested but there is no cough.—Nothing.

8*th.*—Eyes clear, white, bowels moved three times; well in every respect.

11*th.*—Strong and well.—Discharged.

Intermittent Fever with Beriberi.

Condasawmy, aged 26, Genl. No. 1449.

27th March, 1849.—Has been in hospital, since June 1845, four times with intermittent fever, and twice with beriberi, or in the following order, twice with intermittent fever, twice beriberi, and then twice with intermittent fever. This time the beriberic symptoms predominate; complains of fever and giddiness with great debility but says nothing of numbness, skin now cool. Face peculiarly sallow and corpse like, eyes yellowish, dull and fishy, pulse 130 soft, tongue pale, white and clean as if boiled, bowels slow, no signs of effusion any where; lives mostly on rice.

Emetic of Ipecacuan.

28th.—No change, bowels not moved.

Pil. croton and calomel, No. 2.

29th.—Pills operated very slightly, pulse 130, skin cool, tongue pale white, slight effusion in abdomen.

R. Pil. hydrarg. 10 grs. quinine 5 grs. thrice a day, with 5 drops of tincture of iodine, and 5 grs. of hydriodate of potass in three oz. of water thrice a day; diet to consist of dhal, mutton and coarse wheat bread.

30th.—Pulse 100, bowels open, urine very scanty and almost colorless, not above 8 oz. in 24 hours. Other appearances as yesterday.

Continue the medicines.

3d April.—Pulse 130, evidently from mercurial excitement, no effusion any where, tongue not so pale, but now very tremulous, face swelled from blue pill, but no ptyalism.

Omit all the medicines.
Sulphur 1 dr. twice a day.

4th.—Left side of face still swelled, but no increase of secretion from mouth, tongue still pale and tremulous.

Continue sulphur with phosph. of lime 1½ drs. at night.

5th.—Tongue becoming decidedly pink at sides, pulse still 120.

Continue sulphur and phosph. of lime.

6th.—Is extremely active and very hungry to-day, tongue losing the boiled appearance and showing clear pink at sides, pulse 100 regular, bowels moved once since last dose; countenance losing the cadaverous appearance, swelling of face nearly gone, secretion from mouth free.

Omit sulphur.

Continue phosph. of lime.

8th.—Tongue red all over and streaked with a little dark fur but still tremulous, pulse 100 full, regular; countenance much improved, walks well.

Continue phosph. of lime, with animal and pea diet.

9th.—Tremulousness of tongue nearly gone, pulse 94 full, regular; stools light colored, urine neutral but free from phosphates.—Continue medicine.

10th.—Three watery stools this morning, no pain with them, urine neutral, tongue, skin and pulse as above.—Continue medicine.

12th.—Tongue paler, pulse 90.—Continue medicine.

13th.—Tongue of better color, less tremulous, bowels regular, pulse 80 of good strength, urine neutral.

Continue phosph. of lime night and morning.

15th.—Tongue has been pale during last 2 days, and it appears he has returned to rice diet notwithstanding daily cautions, pulse 100 soft weak; tongue tremulous; looks ill.

To continue phosph. of lime, to avoid rice, and adhere to dhal, coarse bread, mutton or eggs.

16th.—Tongue not tremulous and has more color, looks better, urine clear, but slightly alkaline to test paper though only recently passed into a glass vessel, pulse 80 soft, regular.—Continue.

17th.—Tongue improving, pulse 80 full, urine very slightly alkaline.

18th.—Pulse and tongue nearly normal, stools healthy, urine still slightly alkaline, as he will persist in using tamarind in his food, walks well, eats and sleeps well. Has gained a good deal of flesh since admission, wishes to go to duty.—Discharged.

7th January, 1851.—This patient has not been again in Hospital.

The next two cases were treated and reported by Assist. Apothecary Lima, doing duty 23d Regiment, W. L. I.

Quotidian Intermittent Fever.

Yenketkistnaraj, Private, 8th Company, No. 1627.

2nd January, 1851.—Admitted 6 A. M., complaining of fever which comes on daily, sometimes at noon and sometimes towards evening and at night, preceded by rigors for the last five or six days ; last attack 6 P. M. yesterday ; skin at present warm but moist, tongue coated at the base and red at edges, bowels said to be regular, has not been in hospital for the last year.

Phosph. of lime with sulphur 2 drs. thrice a day.

3d.—Return of fever at 7 P. M. yesterday, preceded by rigors, perspired and became cool at 11 P. M., bowels have not been opened yesterday.

Pil. calomel and croton, 6 grs.
Continue phosph.

4th.—Bowels have been freely opened, fever returned but slightly at 9 P. M., is at present cool, tongue cleaning.

Continue phosph.

5th.—No return of fever yesterday, no complaint.

Continue phosph.

6th.—Fever returned at 8 P. M., preceded by rigors and

left him during the night, has perspired freely, bowels not opened yesterday.

Pil. calomel and croton 6 grs.
Continue phosph.

7th.—Fever returned preceded by slight rigors at 9 P. M. last night, perspired at 12 and became cool afterwards, bowels have been freely opened.

Continue phosph.

8th.—Fever as usual but later at night, states that he felt chilly, which was followed by heat of skin about 11 last night, is at present perfectly cool, pulse moderate, tongue cleaning.

Continue phosph.

9th.—No return of fever, skin cool and moist, tongue cleaning, bowels regular.

Continue medicine.

11th.—Convalescent.

12th.—Discharged.

Quotidian Intermittent Fever.

Ramasawmy, Private, 3d Company, No. 1166.

4th January 1851.—Admitted 6 P. M., complaining of the usual symptoms of fever coming on daily for the last five days. Paroxysm generally about 6 A. M., preceded by rigors and leaving him about 12 at night, says that he does not perspire, skin at present warm and rather dry, pulse excited, tongue coated at the base and red at the tip, bowels confined ; has not been into hospital for the last year.

Phosph. of lime and sulph. 2 drs. thrice a day.

5th.—Has had a return of fever as usual preceded by rigors at 6 P. M., yesterday, perspired during the night, is at present cool and moist, pulse moderate, tongue the same, bowels once opened.

Continue phosph.

6th.—Return of fever at 9 P. M., felt a little chilly but no rigors, bowels have been opened, tongue the same, the fever did not last for more than two hours.

Continue phosph.

7th.—Says that he felt a little chilly and warmth of skin at 11 last night, and perspired afterwards, tongue cleaning, bowels regular.

Continue phosph.

8th.—No return of fever.

Continue medicine.

9th.—No complaint, tongue still loaded at the base but cleaning at the forepart.

Continue remed.

10th.—No return of fever, tongue natural, bowels regular.

11th.—No complaint.

12th.—Discharged.

A. BLACKLOCK,
Assistant Surgeon,
23d Regt. W. L. I.

KAMPTEE,
9th February, 1851.

NOTE.—In the early part of 1850, Assistant Surgeon A. Blacklock, embodied some remarks on the treatment of fever with phosphate of lime and sulphur in his annual report of the 23d W. L. I. then under his charge, and the Medical Board being of opinion that they were possessed of much interest, and moreover that the subject was one of great importance, requested Mr. Blacklock to give his views in detail of the mode of action of this medicine.

At the same time under instructions from the Board, a Committee of medical officers was convened at Kamptee, to institute a careful practical investigation, as to the therapeutic properties of this remedy (phosphate of lime with sul-

phur) at the several hospitals under the immediate guidance and direction of the Superintending surgeon.

The foregoing most valuable and interesting paper has been the result; the reasoning is highly ingenious, but the correctness of the data in some particulars would appear to be doubtful; example at page 13, speaking of the greater prevalence of fever amongst the Hindoo portion of the population, owing to the different nature of their food, containing less of phosphates, the returns of the Native Army for a period of three years ending 1852, would show that the ratio of fever, or the liability to that disease is almost the same in both bodies of men; the ratio per 1000 of strength being 326· amongst the Hindoos, and 322· amongst the Mussulman in the infantry, while in the native cavalry the ratio for the same period has been, Hindoos 300· and Mahomedans 344·.

The cases that follow give also somewhat equivocal results; but there can be no question however that the fever powder will be very useful in the milder forms of distinct intermittent fever, such cases as those detailed by surgeon Drever, and it may thus enable us to husband our stock of quinine and bark, where fever is periodically endemic as at Seetabuldee, and in the out-posts of the northern division, &c.

The Medical Board are taking steps to give this remedy a more extensive trial, conceiving that its use should be encouraged at any station where it may be found to be advantageous; it is simple in its nature, cheap and easily procurable.

A. L. *Secy. Med. Board.*

CASES TREATED BY ASSISTANT SURGEON DR. ANDERSON.

Febris Quotidiana Intermittens.

Abbas Ally, Driver, D Company, 23 years in the Service.

Admitted at 10 o'clock A. M. on the 7th November 1849, when he stated that he had a paroxysm of fever on the 5th. It began at 3 P. M., and recurred the following day at

the same time. The last paroxysm passed through the stages of cold, heat and sweating; during the first he says there was merely cold, tongue foul, bowels confined.

Can assign no cause for the attack.

Pulv. jalapæ com. 1 dr. statim.

Vespere, frequently moved by the jalap powder which he says has weakened him much. There has been slight pyrexia since 3 o'clock.

Phosph. of lime with sulphur 2 drs.
To be taken immediately.

8th.—Perspired slightly after the powder, when is not exactly known, three stools in the night, apyrexia this morning.

The fever powder to be repeated now, and again at 5 P. M.

9th.—The powders caused no sensible action, but there has been no return of fever, bowels open.

Omit powder.

11th.—Has remained well.—To duty.

Febris Quotidiana Intermittens.

Chellivan, Driver, D Company, aged 25, General No. 1176, 7 years in the service.

This man is of spare habit of body. He was admitted into hospital on the 16th April 1850, but he presented himself the previous morning when he was detained under observation, as he said he did not feel well, had no appetite, and his bowels had not been moved for 48 hours, he had then no heat of surface ; took calomel 5 grs. and pulv. jalapæ com. 1 dr. which purged him smartly ; about an hour afterwards he became restless, his skin was hot and he complained of thirst. These symptoms remained till 3 P. M. when he began to perspire. This morning he states that he feels weak and is without appetite, tongue is coated with a whitish fur, the surface is cool.

Mist. salina simp. 1½ oz.
Every 3d hour until the bowels act.

17th.—Fever returned at 11 o'clock A. M. yesterday, there was first a chill, then heat of skin, thirst and general uneasiness, no headache; began to perspire sometime during the night, bowels were 4 or 5 times moved by the saline mixture. This morning apyrexia, but there is a white fur on the tongue, he is still without appetite and he complains of thirst and general debility.

2 drs. of phosphate of lime with sulphur thrice daily.

6 P. M.—Has taken 3 powders, but fever returned at ½ past 11 o'clock, there was no cold stage; but there were heat of skin, thirst, vertigo and a general feeling of soreness and debility; bowels scantily moved once, tongue is less furred, began to perspire slightly an hour ago, and he is now bathed in perspiration. Pulse 102.

Continue powder.

18th.—A good night, skin cool, pulse of natural frequency, tongue is white with a red-edge, no stool.

Continue powder thrice a day.

Vespere, fever returned at 2 P. M., skin remains hot; but on the forehead there is a slight moisture; vertigo, debility and thirst are what he complains of; four pale yellow feculent stools, there was no rigor, tongue furred.—Continue.

19th.—Heat of surface left at 8 o'clock P. M.; a good night, tongue is nearly clean, complains of nausea but there is perfect apyrexia, one scanty stool evidently containing sulphur.

Continue powder thrice daily.

Vespere, heat and dryness of surface; restlessness, thirst and vertigo since 2 o'clock P. M. Complains of a sense of internal heat and of griping, no tenesmus, two loose feculent stools of the colour of sulphur and containing two clots of blood. Pulse upwards of 100, skin hot and dry.—Continue.

20th.—Fever did not leave till late in the night, two stools, feculence of a pale yellow colour, apyrexia, no abdominal uneasiness, tongue is nearly clean and moist.—Continue.

Diluted nitric acid as a drink, 2 drs. to 24 ozs. of water in the day.

Vespere, fever since 4 P. M., symptoms much as in former attacks. It continues, no return of abdominal uneasiness, tongue is pretty clean, he complains of thirst, two consistent stools coloured by the sulphur.—Continue.

21st.—Fever left during the night, to-day apyrexia, tongue clean and moist, one feculent stool.

Continue powders and the acid drink.

22d.—Fever returned at 8 P. M. no cold stage, but there was a distinct hot one followed by sweating; two feculent stools, apyrexia this morning.

Continue powders and drink.

23d.—Fever returned as before at ½ past 8 o'clock, there were present heat of skin, vertigo, nausea, thirst and great muscular debility, feverish symptoms left during the night about 11 o'clock it is believed, three stools; there is a brown fur on the middle of the tongue, edges clean, pulse 78.

Pulv. Cinchonæ 2 drs. every 2d hour to the 4th time.

24th.—No return of fever.—Nil.

25th.—Convalesces.

1st May.—To duty.

FEBRIS QUOTIDIANA INTERMITTENS.

Caulapen, Driver, D Company, aged 37, 14 years in the service, No. 722.

Admitted on the evening of the 19th May, 1850, with slight febrile symptoms which left at 8 P. M. Took on admission calomel, pulv. antim. comp. of each 5 grains, and 2 oz. of simple saline mixture, (a weak solution of salts and tartar emetic) by which his bowels were moved five times.

20th.—Apyrexia; by account on the 17th had a chilly feel-

ing which returned yesterday at 3 P. M., and was succeeded by heat, &c.

Mist. salina simp. 2 oz.
ter in die.

21st.—Had a return of fever yesterday. It began by a chill at 2 P. M. afterwards there were heat and dryness of skin and headache. The attack terminated in sweating at 7 o'clock P. M., took three doses of saline mixture by which his bowels were moved twice. This morning perfect apyrexia, tongue coated with a whitish fur.—Nil.

Vespere, fever returned at 3 P. M. commencing with a slight chilly feeling; now at 6 P. M. his skin is oool but moist, neither headache nor vertigo were present, one stool; the attack has been slight.

2 drs. of the phosphate of lime with sulphur, immediately.

22d.—Apyrexia, weak and without appetite, bowels not again moved, tongue moist and furred.

Repeat 2 drs. of the powder thrice daily.

Vespere, slight fever from noon till ½ past 2 o'clock P. M., now apyrexia, one stool.

Continue powder.

23d.—No fever.—Continue.

24th.—Heat, dryness of skin and thirst from ¼ to 4 o'clock to 6 P. M., tongue furred, weak and without appetite.—Continue.

25th.—Fever returned yesterday with rigor at 2 o'clock P. M. He began to perspire at ½ past 4 o'clock P. M., now apyrexia.

Pulv. cinchonæ 2 drs.
To take 4 such doses at the intervals of two hours.
Omit phosphate of lime and sulphur powder.

26th.—No return of fever.—Nil.

30th.—Remains free from fever.—To duty.

Febris Quotidiana Intermittens.

Shaik Abdoolah, Horse Driver, A Company, 1½ years in the service.

Of full habit.

Admitted at noon on the 3d October 1849, complaining of fever, which he says attacked him three days ago at 5 o'clock P. M. and since has recurred daily. It does not leave him till early in the morning; tongue furred, vertigo, bowels confined, but there was no fever on admission.

Rec. calomel 4 grs.
Pulv. jalapæ comp. 2 scru. mft.
Pulv. statim sumendus.

Vespere, skin hot and dry, pulse accelerated, much vertigo and pain in the extremities, thirst and nausea, bowels once moved.—Nil.

4th.—A restless and sleepless night, fever remains unabated, skin hot and dry, pulse 84; what he complains of are vertigo and pain in the extremities, tongue furred.

2 drs. of the powder of phosphate of lime with sulphur thrice daily.

Vespere, it is said he perspired at noon but skin is now both hot and dry, he is restless, pulse 90, no stool.

Repeat calomel and compound jalap powder, and omit the third dose of the phosphate of lime powder.

5th.—Fever left at 5 o'clock this morning when he perspired profusely, two copious stools, at present no fever.

Repeat phosphate of lime powder 2 drs. thrice daily.

Vespere. Escaped fever.—Continue.

6th.—Fever returned at 11 o'clock P. M., it began with a chill followed by heat of skin and inability to sleep, is now restless and giddy, he complains of thirst and of a feeling of cold, pulse 90, two stools.

Continue powder thrice daily.

Vespere, perspired after the first dose of the powder, about 10 o'clock skin became hot and dry and so it continu-

ed till 5 P. M. when he began to perspire; at present skin is warm and moist, bowels once moved, pulse 96, a fur on the tongue, complains of vertigo and of pain all over his body.

Rec. calomel 10 grs.
Pulv. antim. comp. 5 grs.
Mft. pil 3 immediately, and
after two hours to take ol. ricini 1 oz.

7th.—Perspired at 8 o'clock and since has been free from fever, bowels twice moved, evacuations chiefly feculent, apyrexia this morning.

Repeat powder of phosphate of lime as before, thrice to day.

Vespere, has had much fever all day, restless; complains of universal pain, skin hot and dry, bowels not moved, no diaphoresis, took the last dose of the powder an hour ago.

Repeat pil et ol. ricini as yesterday.

8th.—Apyrexia since 4 A. M. 3 stools.

Rec. quinæ disulph. 6 grs.
Acid sulphur dil. 6 gts.
Aquæ—2 oz. ft.
haustus omni hora ad 3 tam vicem.

Vespere, slight fever from 10 A. M. till 6 this evening, bowels free.—Nil.

9th.—Apyrexia, has passed a good night.

Repet haustus ut heri.

10th.—Escaped fever yesterday.—Nil.

He had no return of fever, and on the 14th he was discharged to his duty.

Febris Quotidiana Intermittens.

Sundeogh, Driver, D Company, aged 25, 7 years in the service, No. 1179.

Admitted on the 18th August 1850, by account has had fever daily since the 14th, in a paroxysmal form; on that day

it began at 10 A. M. and ended at 6 P. M. On the ensuing morning at 10 o'clock, the fever returned and remained till noon. On the 16th a third paroxysm from 2 to 3 P. M.; he says he had fever from 3 to 5 A. M., this morning; on admission tongue foul, bowels open from medicine he had taken, complained of debility and loss of appetite, skin cool.

Mistr. salina simp. 2 oz.
ter in die.

19th.—Had a return of fever at 10 o'clock P. M. which did not leave him till 7 A. M., tongue still furred, bowels slightly moved by the saline mixture.

Powder of the phosphate of lime with sulphur 2 drs. thrice to-day.

20th.—Was attacked with fever at 10 o'clock yesterday evening. It left him at midnight when he perspired freely, bowels open, tongue clean.

Repeat powder as yesterday.

21st.—Perspired freely throughout the day but this morning at 1 o'clock there began a paroxysm of fever that lasted for 3 hours, tongue slightly furred, bowels twice moved; at present apyrexia.

Repeat powder.

22d.—No return of fever.—Nil.

25th.—Discharged to duty.

Febris Quotidiana Intermittens.

Michael Conway, Half-pay bugler, A Company, aged 14. Born in India.

This boy was detained in hospital under observation on the 16th May, he came to hospital stating that he had fever; that it came on, on the 15th about noon, on admission, however, skin was cool but tongue foul, he had no appetite

and said he felt unwell, bowels slow; he took calomel 4 grs. pulv. jalapæ comp. 2 scru. by which his bowels were twice acted on; at noon heat of surface, headache, pain in the eyeballs, and redness of conjunctiva with flushing of the face and restlessness supervened; saline mixture 1 oz. every 3rd hour was given and 6 leeches were put on the temples, he began to perspire about 9 o'clock after he had taken calomel and pulv. antim. comp. each 3 grs. The saline mixture was at that time omitted.

17*th.*—Apyrexia, has slept, bowels not again moved, tongue furred, white with a central reddish patch.—Spoon diet.

Pulv. phosph. of lime with sulph. 1½ drs. ter in die.

18*th.*—No return of fever, no evident action of medicine except that it moved his bowels once.—Stool not kept.

Repet ut heri.

19*th.*—One feculent stool of the colour of sulphur, he has remained well since last report.

Omit pulvis.—Low diet.

21*st.*—Well.—To duty.

Febris Tertiana Intermittens.

Patrick James Cassarley, Half-pay bugler, D Company, aged 11 years. Born in India.

Admitted on the 19th April 1850, at 6 o'clock A. M. but he came to hospital the previous day at 4 o'clock P. M. with his mother who gave this account; on the 14th an attack of fever, on the 16th a similar one at the same hour, and on the 18th another, all the attacks began about the same time and ended in perspiration, between 4 and 5 o'clock; when he was brought to hospital his skin was warm and moist, he had headache, general febrile uneasiness and thirst, tongue pretty clean, bowels said to be regular, pulse frequent.

Has had intermittent fever at this station in October 1849.

Rec. calomel 3 grs.
Pulv. jalapæ comp. ½ dr. statim.
Spoon diet.

19th.—Bowels once freely moved, his nose bled and he passed a good night, tongue pretty clean, skin cool and moist.

Rec. pulv. phosph. of lime with sulphur 1 dr. ter in die.

20th.—The only effects the powder had were to excite perspiration, which was very free at the evening visit yesterday, and to move his bowels once, stool was consistent and of the colour of the powder; he has had no return of fever.

Repet pulv. ter in die.

21st.—No return of fever, bowels slow. Omit pulvis.

Pulv. jalapæ comp. ½ dr. statim.

22d.—Bowels satisfactorily acted on, no return of febrile disturbance, a herpetic eruption on the mouth, it appeared on the 20th.—Nil.

23d.—Nil.

24th.—Low diet.

28th.—Well since last report.—To duty.

Admitted again on the 3d June 1850 at 5 P. M., with slight fever which by account attacked him at 9 this morning, bowels slow, he therefore was ordered calomel 4 grs. pulv. jalapæ comp. ½ dr. by which his bowels have been moved once; a good night, apyrexia since 7 P. M. abdomen full and tense.

Mistr. purgans 2 ozs. statim, post horas duas 1 oz. si opus sit.—Spoon diet.

5th.—Bowels were well moved, abdomen is now soft and free from uneasiness. There is no symptom of fever.—Nil.

6th.—Convalescent.—Low diet.

7th.—Well.—Discharged.

Febris Tertiana Intermittens.

John A. Dammermoth, bugler, D Company, aged 26.
Born in India.

Admitted on the 1st June 1850, at noon with slight symptoms of fever, which came on at 9 A. M. with a feeling of chilliness; knows no cause for the attack; his tongue being foul and bowels slow, he took 2 grs. of tartar emetic and 1 scru. of ipecacuan by which free vomiting ensued; and calomel 6 grs. and pulv. jalapa comp. 1 dr., which purged him several times.

2d June.—At the evening visit yesterday he was in a state of perfect apyrexia in which he remains.—Nil.

Spoon diet.

Vespere.—Bowels slow.

Extr. colocy. comp. 8 grs.

3d.—As yet bowels not moved.

Pulv. jalapa comp. 1 dr. statim.

Vespere, fever returned at 8 A. M., commencing with a chill, some headache, heat of surface and an aching in his loins and lower extremities with other symptoms followed, he began to perspire a little before noon, and skin is now cool, but headache and muscular soreness and debility remain, four stools not kept.

Pulv. phosph. of lime with sulphur 2 drs. h. s. s.

4th.—The powder caused thirst, tongue coated with a whitish fur, perfect coolness of surface, is weak but he has no pain.

Repet pulvis.

Vespere, no return of fever, one feculent stool of the colour of sulphur.

Continue.

5th.—Fever returned at 4 o'clock A. M. commencing with rigor, followed by headache, pain in the back and limbs, thirst, heat and dryness of skin; he has been and continues to be very

restless, although there is a slight moisture on the skin which is still hot, pulse 96, tongue has its papillæ raised and white.

Continue.

6th.—Fever left at 10 o'clock A. M. yesterday, he has no trace of fever this morning, except the fur on tongue. He feels weak however, skin cool and moist, two feculent stools of the color of sulphur.—Continue.

7th.—Apyrexia from the time of last report till 2 A. M. today, when he had a rigor followed by heat of surface and slight headache, began at 5 A. M. to perspire, skin is now at 6 A. M. cool and moist. The attack much milder than any previous one, no stool, tongue much as it was.

Continue pulvis ter in die.
Rec. acid. nitro-muriat. 2 drs.
Aqua, 24 ozs. mix. fiat
Potus, during the day.

8th.—Apyrexia since last report, two stools whitish feculence with a yellow tint, took the whole of the acid drink, feels weak, tongue is cleaner.

Continue pulvis.
Omit potus.

9th.—Fever returned at midnight commencing with slight rigor which was succeeded by restlessness, thirst, slight headache and slight pain in the lower extremities, skin hot and dry. These symptoms terminated in perspiration at 3 o'clock A. M.; now at 7 A. M. apyrexia, tongue has a whitish sodden appearance, he feels very weak, and looks worn and emaciated, bowels once moved, a feculent stool much of the same appearance as before.

Repeat as yesterday

10th.—No return of fever, bowels once moved evacuation feculent, tongue is less sodden in appearance, he feels very weak, but he slept well and his appetite is good.

Repeat powder.

11*th.*—He himself states that he had fever (heat of skin only) from 10 P. M. till midnight but he called no one, afterwards slept well, tongue is cleaner, appetite good, bowels open, I believe he had no fever.

Omit pulvis.—Low diet.

13*th.*—Has continued well since last report.—Nil.

14*th.*—Well.—Discharged.

Vespere, this man did not leave the hospital, for at 2 P. M. he had a slight chill followed by heat of surface, restlessness, accelerated pulse and slight headache; at 5 P. M., he began to perspire and felt relieved, now complains of headache only, bowels not moved to-day, tongue is clean.

Rec. Pilulæ hydrarg. 4 grains.
Ext. colocynth comp. 6 grs. for bed time.

15*th.*—A good night, apyrexia, two stools.

Mistr. quinæ 2 ozs. 2da. q. q. hora.
Ad. 3 tiam vicem.

16*th.*—No return of fever.

Repet mistr. quina ut heri.

17*th.*—Convalescent.—Low diet.

18*th.*—Half diet.

19*th.*—To duty.

Febris Tertiana Intermittens.

Hugh Kane, Gunner, D Company, aged 34.
Resident in India, 9 years.

13*th July,* 1850.—Admitted on the 12th at 2 P. M., in the cold stage of tertian ague, the 2d paroxysm; the first he had on the 10th it commenced at 2 o'clock P. M. That of yesterday set in an hour earlier at 1 P. M. He had on both occasions all the 3 stages of the disease well marked. On admission tongue being foul and bowels slow he was ordered calomel 6 grs. and pulv. jalapæ comp. 1 dr. by which his

bowels were well acted on once, the motion is dark loaded with bile and frothy, tongue furred at the base.

Pulv. jalapæ comp. 1 dr. statim.—Spoon diet.

14*th*.—Bowels once moved by the jalap; herpetic eruption on the lips, no uneasiness any where, tongue coated with a whitish fur, this is fever day.—Nil.

Vespere, cold stage of a paroxysm commenced at 1 P. M., and was followed by heat and sweating, the latter commencing at 3, and continues to be profuse; attack much less severe than the former, tongue whitish with a red margin, was ordered immediately on the accession of fever, pulv. phosph. of lime with sulph. 2 drs. 3 tis. horis ad. 3 tiam vicem.

Continue powder.

15*th*.—A good night, apyrexia, no stool for 24 hours, tongue in the same state.

Repet pulvis ter in die.
Rec. acid nitro-muriat 1½ drs.
Aquæ—24 ozs. fiat.
Potus-bibat in die.

16*th*.—This is fever day, at present except weakness no complaint, one feculent stool.

Repeat as yesterday.

17*th*.—Escaped fever yesterday.

Omit remedia.
Low diet.

18*th*.—Convalescent.—Nil.

20*th*.—Well.—Discharged.

Febris Tertiana Intermittens.

Mathew McNamarra, Gunner, D Company, aged 23.
Resident in India, 2 years.

Admitted on the 14th July 1850, at 10 o'clock A. M., with the second paroxysm of a tertian ague, which attacked him

on the 12th and on the day of admission at the same hour 10 o'clock; on both occasions, all the three stages, cold, hot and sweating were well marked, the latter commencing at 2 P. M., tongue was foul, bowels slow, much headache.

He took on arrival at the hospital 1 grain of tartar emetic and 1 scruple of ipecacuan by which his stomach was emptied and the powder purged him once.

15*th.*—A good night, this morning apyrexia is perfect, tongue quite natural.—Nil.

Spoon diet.

16*th.*—This is fever day.—Nil.

10 A. M.—Has just had a slight rigor and skin is becoming hot.

Phosphate of lime with sulphur 2 drs. ter in die.

17*th.*—The attack of fever was slight, he began to perspire about noon yesterday; slept well, and there is complete apyrexia this morning, tongue clean.

Repeat as yesterday.

18*th.*—This is the day for the fever to return. Is now well.—Repeat.

19*th.*—No return of fever, bowels open.—Nil.

Low diet.

20*th.*—To duty.

Febris Tertiana Intermittens.

George Maslon, Gunner, D Company, aged 31.
Resident in India, 3 years.

Admitted on the 22d July 1850, at 11 o'clock A. M. in the hot stage of what appeared by his account to be the third paroxysm of a mild tertian ague; the first paroxysm and the last, the one with which he was admitted commenced by slight rigor at 9 o'clock A. M., and the intermediate one which was the longest and most severe at 1 o'clock P. M. tongue furred, bowels slow; he took on admission an emetic

composed of 1 grain of tartar emetic and 1 scru. of ipecacuan and subsequently calomel 5 grains and pulv. jalapæ comp. 1 dr., both of which acted satisfactorily.

23*d.*—This morning perfect apyrexia.—Spoon diet.

24*th.*—Fever returned with rigor this morning and he has now slight heat of surface, pain in back and thighs, a moist whitish fur on the tongue, thirst, bowels twice moved, vertigo.

Pulv. phosph. of lime with sulphur.
2 drs. ter in die.

Vespere, began to perspire at 10 o'clock A. M., and there is now distinct apyrexia, bowels open.—Continue.

25*th.*—Did not sleep well, but this he attributes to his having slept during the day yesterday, a whitish slimy moist fur on the tongue, pulse 66 soft.

Repet pulvis ter in die.
Potus acid. nitro. muriatic.

26*th.*—Fever returned at 4 o'clock this morning, first there was rigor, then heat of surface, pain in the back and other usual but mild symptoms of the hot stage, is now at 7 A. M. beginning to perspire, bowels open, tongue is much as yesterday.

Repet pulv. et potus ut heri.

Vespere, took the first dose of the phosphate at ¼ before 6 o'clock A. M.; perspiration broke forth about 20 minutes thereafter and with it the attack terminated, apyrexia this evening, bowels regular.—Continue.

27*th.*—A good night, an eruption of vesicles on the lips.—Continue.

28*th.*—Fever returned at 4 o'clock this morning commencing with rigor, the hot stage was of short duration and terminated in sweating at 6 o'clock, no uneasiness, complains only of debility, bowels open, tongue is nearly clean.

Omit pulvis.

29th.—Apyrexia now, but fever may be expected to return to-night or very early to-morrow morning.

Mistr. quinæ. 2 ozs. meridie et.
Repet at 4tam vicem 2da. q. q. hora.

30th.—No return of fever.

Omit mistr. quinæ.—Low diet.

31st.—No fever.

Repet mistr. quinæ. 8 ozs.

1st August.—Has again escaped fever.—Half diet.

2nd.—Well.—Discharged.

Febris Tertiana Intermittens.

William Prout, Gunner, D Company, aged 40.
Resident in India nearly 16 years.

Admitted on the 6th June 1850 at 6 P. M. with the usual symptoms of fever which by account attacked him at 3 o'clock this afternoon, had a previous paroxysm on the 4th at ½ past 4 o'clock P. M. tongue foul, bowels slow.

Took 1 grain of tartar emetic and ipecucuan 1 scru., and subsequently calomel 6 grs. pulv. jalapæ comp. 1 dr.

7th.—Emetic acted well, one stool from the purge.

Haust purgans 4 ozs.
Tinct. zingiberis 3 drs. mix fiat. haustus statim.
Spoon diet.

8th.—No return of fever.—Nil.

Vespere, fever returned at 4 o'clock without rigor; the symptoms are mild, he complains of his head only, bowels not open, his skin is hot and dry at present, pulse accelerated, tongue coated with a whitish fur, moist.

Pulv. phosph. of lime with sulphur 2 drs. h. s. s.

9th.—Fever terminated a little after 7 o'clock yesterday evening, he has slept indifferently, he complains of a feeling

of weight in the head this morning, the powder caused him to perspire freely, bowels not moved, tongue pale and coated with a white fur, there is however perfect apyrexia.

Repet pulv. ter. die.

Potus acid nitro muriat. 24 ozs. in die.

10*th*.—No return of fever, two feculent stools, tongue white and sodden in appearance, has slight uneasiness over the right eye brow.

Repet pulvis.—Omit potus.

11*th*.—No return of fever, bowels open, tongue whitish moist, appetite good.

Omit pulvis.—Low diet.

13*th*.—Has continued well since last report.—Nil.

14*th*.—Well.—Discharged.

Febris Tertiana Intermittens.

Robert Wiggins, Gunner, A Company, aged 32.
Resident in India 12 years.

16*th*.—*August* 1850. Admitted at 8 A. M. on the 15th August. He is a court martial prisoner, a man of intemperate habits, spare form and sickly aspect.

Had on admission feelings of chilliness soon followed by heat of surface, headache, and other usual but slight symptoms of the hot stage, during which he took calomel 5 grs. and pulv. jalapæ comp. 1 dr. as his bowels were confined ; the dose has operated well.

This morning apyrexia. By account had on the 13th a febrile attack commencing at 11 o'clock, a slighter attack on the 14th, and the paroxysm of yesterday at 8 A. M.

Nil.—Spoon diet.

17*th*.—It is said that he had heat of skin for an hour yes-

terday, but no one saw him while it was present, he seems to be quite well.

Mistr. salin simp. 2 ozs. ter quater in dic.

8 A. M.—He is now in the cold stage of ague, it is a slight attack.

Pulv. phosph. of lime with sulphur 2 drs. ter in die.

Vespere, the hot stage followed and terminated at 11 o'clock A. M.—Continue.

18*th*—A good night, bowels not moved.

Repet pulvis.
Acid nitro muriatic $1\frac{1}{2}$ drs.
Aqua.—24 ozs. mix.

19*th*.—Bowels have not been moved, no return of fever, but it is expected to-day.

Repet ut heri et.

Injic. enema purgans.

20*th*.—Bowels twice moved by the injection no return of fever.—Nil.

Low diet.

21*st*.—Continues well.

22*nd*.—Bowels slow.

Ol. ricini. 1 oz.

To duty in the afternoon.

FEBRIS QUOTIDIANA INTERMITTENS.

John Kirby, Gunner, D Company, aged 29.
Resident in India 7 years.

Admitted at ½ past 5 o'clock A. M. on the 22d November 1850, with pyrexia, slight headache, nausea, vomiting, and purging, hands tremulous, has been drinking lately. By ac-

count has had fever since the evening of the 17th, it returned every evening, no cause for the attack.

Rec. calomel 10 grs.
Opium 1 gr. mix, fiat pilula 2 statim.
Rec. mistr. purgans 4 ozs.
Pulv. jalapæ comp. 1 scru. after three hours.

Vespere, perfect apyrexia, the tremor less, bowels freely acted on.—Nihil.

23d.—A good night, tremor still continues, says it is owing to excessive indulgence in tobacco which he chews; two stools, they contain some undigested food.

Ol. ricini 1 oz. statim.—Spoon diet.

Vespere, fever returned at 11 o'clock, a well marked paroxysm; is now sweating, bowels moved by oil, a fur on the tongue which is moist, at noon he took 1 dr. of the phosphate of lime with sulphur.

Repet pulvis statim et h. s.

24th.—Continued to perspire all night, was restless, did not sleep. This morning feels giddy and suffers slightly from nausea and thirst, skin warm and moist, tongue clean, one stool feculence of pretty natural appearance.

Repet pulvis ter in die.

25th.—No return of fever, bowels free.—Repeat pulvis.

Vespere, fever returned at noon when he felt chilly, afterwards skin became hot and dry, with slight headache and pains in the loins, tongue remained nearly clean and moist, pulse 120 small, no stool.—Continue.

Temporibus Hirudines xiv.

26th.—About ½ past 5 o'clock began to perspire, he did not sleep well was restless but not from pain. There is perfect apyrexia this morning, one stool, tongue clean and moist.

Repet pulvis ter in die.
Nitro-muriatic drink 24 ounces.

27th.—No. return of fever.—Repeat.

Vespere, fever since noon, it began with a chill followed by heat and dryness of surface, some headache, and a great feeling of aching all over the body, vertigo. Begins to perspire, one stool feculent, tongue furred, moist.

Rec. Calomel, pulvis antim. Comp.
Each 5 grs. mis, fiat pulv. h. s.
Hot foot bath.

28th.—A good night, perfect apyrexia.

Mistr quinæ. 2 ounces omni hora.
ad 4 tam vicem.

29th.—No return of fever, but he could not sleep.—Repeat.

30th.—Slept well. Convalesces.—Nil.—Low diet.

1st October.—Low diet.

3rd.—Well.—Discharged.

Febris Quotidiana Intermittens.

James Malony, Gunner, aged 30, A Company.
Resident in India 8 years.

Admitted at noon on the 22d November, 1850, with the usual symptoms of fever which he says he got yesterday after 10 o'clock P. M. a chilliness followed by heat and sweating. In the morning he was well but fever returned about half an hour before admission. Tongue foul, bowels slow.

Rec. antim. potass tartras 1 gr.
Pulv. ipecacuana, 1 scru. mis, fiat.
Pulvis statim.
Rec. calomel, 6 grs.
Pulv. jalapæ comp. drs. 1 mft. pulvis.
after three hours.—Spoon diet.

Vespere, medicine has not acted.

Mist. salinæ simpl. 2 ounces.
Omni hora ad effectum.

23*d*.—After the 3d dose free purging and sweating, a good night, this morning apyrexia.—Nil.

Vespere, no return of fever.

24th.—At 10 P. M. chilliness followed by the usual symptoms of fever which remains, could not sleep but rolled about on his cot all night, pain in the loins, vertigo, slight headache, pulse 90 ; along with the heat of skin there is partial sweating, much thirst, tongue whitish moist, one pretty natural stool.

Pulv. phosphate of lime with sulphur.
2 drs. ter in die.

25*th*.—No return of fever, bowels slow.

Repet pulvis.

1½ drs. of nitro muriatic acid to 24 ounces of water as a drink, the whole to be taken in the course of the day.

26*th*.—Chilliness returned at 6 P. M., afterwards slight fever, some headache, one stool yesterday, to-day apyrexia, became cool at 4 A. M., tongue slightly white, it is moist.

Repeat as yesterday.

27*th*.—No return of fever, bowels open.—Repeat.

Vespere, fever returned at ½ past 11 o'clock, it began by a chill which was followed by heat and dryness of surface, some headache and thirst. These symptoms are now present and he complains of great debility and vertigo, tongue white and moist.

Rec. calomel, pulv. antim. comp.
Each 5 grs. mis fiat pilulæ h. s. s.
Hot foot bath.

28*th*.—Began to perspire at 7 o'clock after the foot bath. This morning perfect apyrexia, tongue cleaner, bowels open.

Mistr. quinæ 2 ounces, omni hora ad 4 tam. vicem.

29*th*.—No return of fever.

Repet mistr. quinæ ut heri.
Low Diet.

30*th*.—Convalescent.—Nil.

1*st December*.—Nil.

3*d*.—Low Diet.

4*th*.—Well.—Discharged.

REMARKS.

All these cases of intermittent fever (European and Native) were of the most uncomplicated kind, and without exception such as bark or quinine, as usually given, would at once have cured.

Seeing 6 Europeans and 2 native cases, 8 out of 15, got well under the use of Mr. Blacklock's powder, a stranger to the fever of this place will be apt to conclude that the results are very much in favor of the remedy. So many slight cases of ague however recover at this station without any treatment or after one emetic or purgative; and the failure of the remedy in the remaining 7 cases was so signal and contrasted so strongly with the effect of the bark or quinine which had eventually to be employed to prevent the return of the paroxysms that I suspect Mr. B.'s powder possesses very feeble antiperiodic powers. Many slight cases of intermittent fever will, I doubt not, recover under its use, and as it is a cheap remedy it deserves a further trial especially in the cases of natives to whom Mr. B. has given it most extensively and successfully.

The fever powder was slightly laxative and diaphoretic.

Each ounce of the quinine mixture contained 3 grains of quinine. The simple saline mixture was a weak solution of salts and tartar emetic.

J. ANDERSON, M. D.
Assistant Surgeon,
3d Battn. Artillery.

KAMPTEE,
12*th December*, 1850.

CASES TREATED BY SURGEON JOHN DREVER.

Febris Quotidiana Intermittens.

Private, Shaikh Emaum, D Troop, No. 382, aged 33 years, service 17 years.

Admitted 14th August 1850. Complaining of having suffered from fever since 12 A. M. yesterday, which left him at 12 P. M., with free perspiration, no previous rigors. It came on again at 2 A. M., skin hot, pulse quick, bowels confined, no thirst, no headache, tongue coated with red margins. Can assign no cause.

Rec. phosph. of lime with sulphur 2 drs. ter die.

Vespere, 5 P. M., slight remission at 2 P. M., of short duration, one dejection, skin now hot and dry.

Repeat 2 doses of phosph. during the night.

15*th*.—Fever continued last night without remission, but had free perspiration, no local pains, skin warm, pulse small and quick, no thirst, two dejections, did not rest well.

Continue phosphate ter die.

16*th*.—The fever subsided last night, has had no return, skin cool and moist, tongue cleaning, no headache, no thirst, bowels opened, urine free and high colored.

Continue phosphate.

17*th*.—Free from fever, complains of general weakness, skin cool, in other respects the same, took one dose of phosphate of lime with sulphur last night.

Continue med.

18*th*.—Well.—Discharged.

Febris Quotidiana Intermittens.

Private, Shaikh Homed, C Troop, No. 675, aged 25 years, service 7½ years.

Admitted 15th August 1850, 5 P. M. Complaining of gen-

eral febrile symptoms, skin hot, pulse frequent, tongue coated, bowels regular, no thirst or headache, muscular pains all over the body; states that the fever came on 3 days ago with slight remission at times, perspiring then freely, no previous rigors; no cause for his complaint.

Rec. phosphate of lime with sulphur 2 drs. ter die.

16*th.*—Fever continued last night and left him at 5 A. M., was very restless, skin now cool and perspiring, pulse weak, tongue coated with red margins, two dejections, urine free and high colored.

Continue phosphate.

17*th.*—Fever returned last night, was restless, skin now hot, pulse frequent, tongue the same, one dejection, urine free.

Continue phosphate.

18*th.*—Fever left him yesterday morning and is free from it since, bowels opened.

Continue phosphate.

19*th.*—Return of fever at 10 A. M. yesterday, and it continued till 4 A. M. this morning, skin still rather warm, tongue white, pulse small, one dejection, urine free.

Continue phosphate.

20*th.*—Heat of skin subsided during the day, and slight return of it last night, at present functions natural.

Continue phosphate.

21*st.*—No fever yesterday, feels better, two dejections.

Continue phosphate.

22*d.*—No fever, well.—Discharged.

Febris Quotidiana Intermittens.

Private, Kissen Singh, B Troop, No. 380, aged 41 years, service 17 years.

Admitted 22d August 1850, 5 P. M. Complaining of having suffered from febrile symptoms for the last 3 days pre-

ceded by rigors with morning remissions succeeded by free perspiration, skin hot and dry, tongue coated in centre with red margin, pulse quick, headache, pain across the loins and limbs, bowels irregular, no thirst, urine free.

Rec. phosph. of lime with sulph. 2 drs. ter die.

23d.—Fever continued till 5 A. M., skin now cool, tongue the same, pulse soft, two dejections, urine free, pain of head better, did not rest well.

Continue phosphate.

Vespere, 5½ P. M. slight return of fever at 4 P. M., pulse 80 small, skin now perspiring, bowels confined.

Repeat 2 doses of phosph. during the night.

24th.—Return of fever at 1 and left at 3 A. M. without previous rigors, but perspired slightly, was very restless, pains of limbs the same, skin moist, pulse weak, tongue brown and dry, slight pain of head and heavy, no thirst, very weak, three dejections, urine free.

Continue phosphate,

25th.—Return of fever at 10 A. M. and continued till 5 A. M., no rigors, slight perspiration, passed a restless night, skin now perspiring, pulse soft, tongue brown and dry, no thirst, head still heavy and feels giddy but no pain, pains of limbs not better, very weak, one dejection, urine free and scalds but not high colored.

Continue phosphate.

26th.—No return of fever since last report, slept a little, skin cool, pulse small, tongue foul and moist, giddiness the same, does not feel any heaviness of the head, pain of limbs less, one dejection, urine the same, is anxious to have an emetic.

Rec. pulv. ipecac. 20 grs.
Ant. pot. tart. 1 gr. M. st.
Continue phosphate.

28th.—Has continued free from fever for the last 4 days,

feels still giddy, and has heaviness of head, bowels opened, but not freely, in other respects well.

Omit phosphate.

Rec. pulv. jalap com. 1 dr. st.

29th.—Bowels have been freely acted on, and functions seems natural.—Discharged.

The above patient had a return of fever some time afterwards, was treated with an emetic, purgatives and quinine, and discharged well in seven days, no relapse since, now nearly three months.

Febris Quotidiana Intermittens.

Private Shaikh Homed, E Troop, No. 315, aged 34 years, service 9 years.

Admitted 24th August 1850, 6 A. M. Complaining of having suffered from fever for the last three days, generally with evening accessions and morning remissions, the fever preceded by rigors, which lasts nearly two hours followed by heat of skin and succeeded by perspiration. On his admission this morning the following symptoms were present, skin hot and dry, pulse hard and frequent, tongue brown in centre, bowels irregular, was restless, states that the fever came on at 10 P. M. last night and continues still, urine high colored, no thirst, appetite indifferent.

Rec. phosph. of lime with sulph. 2 drs. ter die.

25th.—Fever left him at 11 A. M. with free perspiration, and returned last night at 10 preceded by rigors, remained till 12½, passed a restless night, skin now cool, pulse small, tongue coated with brown lines in centre with red margin and moist, no thirst or headache, complaining of pain of back and limbs, appetite bad, one dejection, urine scanty and high colored.

Continue phosph.

Vespere, return of fever at 12 A. M., skin at present per-

spiring, has a tendency to nausea, slight giddiness, bowels opened.

Rec. calomel 8 grs.

Pulv. jalap comp. 2 scru. M. st.

26*th.*—No return of fever, giddiness and nausea the same, skin cool and moist, pulse soft, tongue brown, pains of body the same, did not rest well, medicine operated well.

Continue phosph.

Vespere, return of fever from 10 till 12 A. M. skin now cool, pulse soft, tongue white, pain of body better.

Repeat one more dose of phosph.

27*th.*—No return of fever, is weak, in other respects well.

Continue medicine.

Vespere, 6 P. M., return of fever from 10 till 12 A. M. without rigors, perspired a little, no headache or giddiness, skin cool, pulse soft, tongue clean, 3 dejections, urine free, appetite indifferent.

Repeat 2 doses of phosph.

28*th.*—Free from fever since last report, slept well, skin cool and moist, tongue clean, bowels opened.

Continue phosphate.

29*th.*—Free from fever for the last two days, feels weak, slept well, appetite good, urine free, three dejections, skin and pulse natural.

Omit med.

30*th.*—Improving.

Nihil.

31*st.*—Well.—Discharged.

Febris Quotidiana Intermittens.

Private Shaikh Madar, D Troop, No. 607, aged 26 years, service 8 years.

Admitted 25th August 1850, 3½ P. M. Complaining of

having had fever for the last six days attended with previous rigors which lasted half an hour, then the heat of skin followed generally with morning remissions succeeded by slight perspiration; the fever is said to have come on just now with previous rigors, skin hot and dry, pulse hard and frequent, tongue brown in centre with red margin, bowels regular, no thirst or headache, pains of back and limbs, feels giddy.

Rec. phosphate of lime with sulphur 2 drs. ter die.

26th.—Fever left him at 2 A. M. with slight perspiration, skin at present rather warm, pulse small, tongue brown, bowels opened, giddiness the same, pain of body less.

Continue phosphate.

Vespere, 6 P. M., warmth of skin subsided at 10 o'clock, and returned at 2½ P. M., skin warm, pulse frequent, tongue foul, two dejections, giddiness the same, pain less.

Repeat 1 dose of phosphate.

27th.—Fever continued till 4 A. M., did not rest well, skin perspiring, pulse soft, tongue foul, one dejection, complains of heaviness and giddiness of head.

Continue phosphate.

Vespere, 6 P. M. slight return of fever at 11 A. M. and remained till 4 P. M., skin now cool, pulse soft, tongue brown, four dejections, heaviness the same, is weak.

Repeat two doses of phosphate.

28th.—No return of fever, slept well, skin cool and moist, in other respects better, bowels opened.

Continue phosphate.

29th.—Slight return of fever at 12 P. M. which remained for half an hour, without rigors, perspired freely, slept well, slight pain of body, much thirst, skin cool, tongue very foul with red margin, pulse soft, one dejection.

Continue phosphate.

30th.—No return of fever, feels better, bowels opened.
Continue.

1st September.—Improving, bowels opened.

Omit med.

2d.—Well.—Discharged.

Febris Quotidiana Intermittens.

Jemadar Noorodeen, D Troop, No. 64, aged 47 years, service 32 years.

Admitted 25th August 1850, 5 A. M. Complaining of having suffered from fever since 5 P. M. yesterday, preceded by rigors which lasted half an hour, and the remission is said to have taken place at 12 P. M., but returned at 4 A. M. with the usual rigors and continues still; skin hot and dry, pulse hard and frequent, tongue brown with red margin, heaviness and pain of head, muscular pains all over the body, bowels irregular, slight thirst, urine scanty and high colored, no appetite.

Rec. phosphate of lime with sulphur 2 drs. ter die.

26th.—Fever left him at 12 P. M. with free perspiration, slept well, skin rather warm, pulse frequent, tongue the same, headache better, pain of body much better, one dejection, urine and thirst the same.

Continue phosphate.

27th.—Fever returned last night, was very restless, but is now free from it, no headache, two dejections, pain of body the same, had two more doses of phosphate last night.

Continue phosphate.

28th.—Fever returned last night, and is now free from it, skin cool, pulse soft, tongue cleaning, three dejections, urine the same.

Continue phosphate.

Vespere, 6 P. M., fever returned at 12, but is now perspiring, tongue and pulse the same, two dejections.

Continue phosphate.

29th.—Was free from fever since last report, but did not rest well, skin cool and moist, pulse soft, tongue clean, three dejections, urine free.

Continue phosphate.

30th.—No return of fever, slept well, functions seem natural.

Continue phosphate.

31st.—Improving, bowels opened.

Omit med.

2d September.—Well.—Discharged.

Febris Quotidiana Intermittens.

Private Cajah Mahomed, C Troop, No. 794, aged 23 years, service 12 years.

Admitted 25th August 1850, 5½ P. M. Complaining of having suffered from fever for the last two days, preceded by slight rigors and followed by heat of skin ending in the mornings by free perspiration; skin at present hot and dry, pulse quick, tongue white with red margin, slight pain of limbs, no headache, much thirst, bowels regular, appetite bad, urine scanty and high colored and scalds; the febrile symptoms said to have come on at 5 P. M.

Rec. phosphate of lime with sulphur 2 drs. ter die.

26th.—Fever continued till 8 P. M. and returned again at 10 P. M. without rigors and lasted till 4 A. M. did not perspire, skin warm, pulse frequent, tongue very foul and red at the margin, less thirst, urine the same, bowels confined.

Rec. haust. purgans 4 ozs. st.
Continue phosphate.

Vespere, 6 P. M., fever continued till 2½ P. M. though per-

spired freely, but skin still warm, pulse quick, tongue foul, purgative operated well.

Repeat one dose of phosphate.

27th.—Was free from warmth of skin till 11 P. M., when it returned and lasted till 5 A. M., skin still perspiring, pulse soft, tongue foul, two dejections.

Continue remedies.

28th.—Slight return of fever yesterday of short duration and did not return since, skin cool and moist, pulse soft, tongue cleaning, two dejections.

Continue phosphate.

29th.—No return of fever since last report, skin cool, pulse small, tongue clean, urine free, complains of giddiness, no headache, and is weak.

Continue phosphate.

30th.—No return of fever, bowels opened.

Continue phosphate.

1st September.—No fever, bowels opened.

Continue med.

2d.—Well.—Discharged.

This patient had a return of febris quotidiana intermittens 16 days afterwards, was treated with an emetic, purgative and quinine and discharged well in four days, no relapse since, now nearly three months.

FEBRIS QUOTIDIANA INTERMITTENS.

Private Adbul Cawder, E Troop, No. 847, aged 22 years, service 4 years.

Admitted 25th August 1850, 5½ P. M. Complaining of having suffered from fever for the last two days with previous rigors and two remissions succeeded by slight perspiration, it has returned at 2 P. M. to-day with rigors, skin now warm and dry, pulse frequent, tongue foul with red margin,

no headache or pain of limbs, bowels regular, urine high colored, appetite good, much thirst.

Rec. phosphate of lime with sulphur 2 drs. ter die.

26*th.*—Fever left him at 2 A. M. with free perspiration, he is free from it now, skin cool and moist, pulse soft, tongue foul, was restless, bowels confined, urine the same.

Continue phosphate.

Vespere, slight heat of skin, pulse small, tongue foul, bowels opened.—Continue.

27*th.*—Heat of skin subsided during the evening and a slight return again from 10 till 12 P. M., skin cool, tongue the same, pulse soft, no stool, slept a little, urine high colored.

Continue phosphate.

Vespere, 6 P. M., return of fever from 10 till 12 A. M., preceded by rigors did not perspire, rejects food, bowels opened.

Repeat two doses of phosphate.

28*th.*—Free from febrile uneasiness, which has not returned since last report, was restless, skin cool, pulse small, complains of giddiness, no headache, bowels opened, is weaker, urine high colored.

Continue phosphate.

29*th.*—No return of fever, perspired freely last night, slept well, skin cool and moist, pulse small, tongue clean, one dejection, feels weak, appetite better, urine free and natural.

Continue phosphate.

30*th.*—No fever, bowels opened.

Omit med.

31*st.*—Well.—Discharged.

FEBRIS QUOTIDIANA INTERMITTENS.

Private Shaik Budrodeen, D Troop, No. 803, aged 30 years, service 13 years.

Admitted 26th August 1850, 5½ A. M. Complaining of having suffered from fever for the last three days, preceded by rigors with morning exacerbations, and afternoon remissions followed by perspiration; it returned at 2 A. M. with slight rigors, which lasted half an hour, then the heat of skin followed, skin now warm but perspiring, pulse hard and frequent, tongue brown in centre with red margin, muscular pain of body, no headache, feels giddy, bowels regular, appetite bad, urine free, much thirst, states that he has not been exposed, and can assign no cause.

Rec. phosphate of lime with sulphur 2 drs. ter die.

Vespere, 6. P. M., slight warmth continued, but has began to perspire now, pulse quick, tongue very brown, two dejections, in other respects the same.

Repeat one more dose of phosphate.

27th.—Warmth of skin continued, did not rest well, skin perspiring, pulse soft, tongue brown, feels giddy, bowels opened.

Continue phosphate.

28th.—No return of fever, skin cool and moist, pulse weak, tongue cleaning, giddiness better, bowels opened.

Continue phosphate ter die.

Vespere, 6 P. M., skin hot, pulse quick 94, tongue white, two dejections.

Repeat two doses of phosphate.

29th.—Heat of skin continued till 8 P. M., says he slept well, skin cool, pulse soft, tongue clean, two dejections, no thirst.

Continue phosphate.

30th.—No return of fever, bowels opened.

Omit med.

31st.—No fever, functions natural.—Well.—Discharged.

Febris Quotidiana Intermittens.

Private Karojee Row, A Troop, No. 817, aged 24 years, service 5 years.

Admitted 26th August 1850, 4 A. M. Complaining of having suffered from fever, since 3 A. M. this morning, preceded by severe rigors which lasted an hour, then the heat of skin came on, skin now hot and dry, pulse hard, tongue very brown in centre with red margin; feels giddy with heaviness of head, of which there is no pain, muscular pains of body, slight redness of conjunctiva, much thirst, appetite bad, bowels regular, urine high colored; states that he has been subject to fever since his arrival here, and never been exposed.—Can assign no cause.

Rec. phosphate of lime with sulphur 2 drs. ter die.

27th.—Fever continued during the night, was very restless, skin now perspiring, pulse soft, tongue brown, two dejections, feels giddy, much thirst, urine free.

Continue phosphate.

Vespere, 6 P. M., slight warmth continued till 4 P. M., did not rest well, skin perspiring, pulse quick, tongue brown, giddiness and heaviness the same, no pain of head, four dejections, appetite bad, urine free.

Repeat 2 doses of phosphate.

28th.—Free from fever, was restless, skin cool and moist, tongue cleaning, pulse soft, bowels opened, feels weakness and giddy, also heaviness of the head.

Continue phosphate.

Vespere, return of fever at 5 P. M., and warmth of body still continues, very restless, tongue foul, bowels opened.

Repeat 2 doses of phosphate.

29th.—Fever left him at 7½ P. M., did not rest well, skin now cool and moist, pulse soft, tongue foul with red margin still giddy, no appetite, two dejections, urine free.

Continue phosphate.

Vespere, 6 P. M., slight return of fever this afternoon, is now free from it, bowels opened.

Repeat 2 doses of phosphate.

30th.—Return of fever at 3 A. M., skin still warm and dry, bowels opened 4 times.

Continue phosphate.

Vespere, 6 P. M., after morning report the fever subsided, but returned preceded by rigors at 10, skin still hot and dry, pulse quick, bowels opened 3 times.

Repeat phosphate 2 doses.

31st.—Skin at present cool and moist, tongue clean, bowels opened, urine free and natural, thirst urgent.

Continue phosphate.
Rec. imperial drink.

1st September.—No return of fever, bowels opened, tongue clean.

Continue phosphate.

2d.—No fever, bowels opened.

Omit med.

3d.—Well.—Discharged.

FEBRIS QUOTIDIANA INTERMITTENS.

Private Mahomed Rajah, B Troop No. 463, aged 33 years, service 13 years.

Admitted 28th August 1850, 5 P. M. Complaining of having suffered from fever from 12 o'clock last night, preceded by slight rigors and left him slightly at 2 A. M., succeeded by free perspiration, but skin still rather warm, pulse soft, tongue white, slight pain all over the body, bowels regular, urine high colored, appetite bad; has been exposed to night wind, while on guard duty last night.

Rec. phosph. of lime with sulphr. 2 drs. ter die.

29th.—Slight heat of skin still remains, although he per-

spired freely, rested well, pulse quick, tongue clean, one dejection, pain of body less, urine and appetite the same.

Continue phosphate.

30th.—Slight heat of skin yesterday about 2 P. M., now cool, tongue clean, bowels opened.

Continue phosphate.

31st.—Is free from fever, tongue natural.

Continue phosphate.

1*st September.*—Well.—Discharged.

This patient had a return of fever 2 months afterwards, was treated with an emetic, purgatives and quinine, and was discharged well in 5 days, no relapse since.

Febris Quotidiana Intermittens.

Private Mahomed Devon, E Troop, No. 533, aged 28 years, service 11 years.

Admitted 28th August 1850, 5 P. M. Complaining of having suffered from fever since 12 A. M. preceded by slight rigors, skin perspiring, pulse quick, tongue brown with red margins, bowels regular, giddy and feels thirsty, no pain any where; can assign no cause.

Rec. phosph. of lime with sulphur 2 drs. ter die.

29th.—No return of fever, slept well, skin cool, pulse soft, tongue the same, states he feels well, 2 dejections.

Continue phosphate.

30th.—No return of fever, but complains of giddiness and nausea, tongue foul, bowels opened.

Omit phosphate
Rec. pulv. ipecac. 20 grs.
Ant. pot. tart. 1 gr. st.

31*st.*—Emetic operated well, and giddiness relieved; skin, pulse, tongue, natural.

Nihil.

1*st September.*—Well.—Discharged.

Febris Quotidiana Intermittens.

Private Ebrahim Khan, D Troop, No. 823, aged 22 years, service 5 years.

Admitted at 7 A. M. 31st August 1850. Complaining of having had fever since 2 o'clock last night preceded by rigors, at present skin hot and dry, pulse excited, tongue foul with red margins, sallowness of conjuctiva; one dejection yesterday, no headache or giddiness, but has pains of limbs, much thirst, urine high colored, no appetite; can assign no cause.

Rec. phosph. of lime with sulph. 2 drs. ter die.

Vespere, 6 P. M. continued feverish all day now cool, tongue cleaning, bowels opened, urine free.

Continue remed.

1*st September.*—No fever, bowels confined, tongue cleaning.

Rec. pulv. jalap com. 1 dr. st.

Continue phosphate.

2*d.*—No fever, bowels opened.

Continue phosphate.

3*d.*—Improving, bowels opened.

Omit medicine.

4*th.*—Discharged.

Kamptee, 31*st December,* 1850.

JOHN DREVER,
Surgeon, 4th L. C.

Extract from the Annual Medical Report of Assistant Surgeon G. W. WALTER, *Tavoy, dated* 1st *April,* 1851.

In the treatment of the intermittent having an insufficient supply of cinchona, I was frequently compelled to trust entirely to the combination of phosphate of lime and sulphur, as recommended by Assistant Surgeon Blacklock, nor did I see any reason to regret this necessity, for at this station it has fully proved itself a most efficient remedy, and in the majority of the agues by which the sepoys have been affected, it has cut short the disease, in as short a time as any remedy could have done, and in a large number of the natives suffering from the same disease, it has been quite as efficacious; in a few cases after persisting in its use for some time without effect, I have substituted bark and quinine, but these cases have generally proved very obstinate even with the latter remedies, and possibly might have yielded in the same time, had the former combination been persisted in.

STATEMENT OF A CASE OF CHYLO-SEROUS URINE, WITH AN ANALYSIS OF THE MORBID SECRETIONS.

BANGALORE, 1*st June*, 1850.

About the end of March 1850, I was requested to visit Mrs. Catharine R., an Indo Briton, aged 22 years, married, and the mother of three healthy children, the youngest of whom, 10 months old, is a particularly strong, and healthy infant, she has been nursing up to the present time, although of late with a very scanty supply of milk: she is a tall young woman, very thin, but of a healthy appearance, and according to her own account, her general health is very good. When nursing her two eldest children, which she continued to do, until they were 14 or 15 months old, she states, that she observed for some time previous to weaning them, that her urine had become white, like milk, which peculiar appearance it lost soon after she discontinued nursing.

Towards the end of November last, her infant being then, about five months old, attention was again attracted to the peculiar white appearance the urine had assumed, when she applied for medical advice, and the following is the account of her condition given by the medical officer, by whom she was then attended.

"Mrs. R. appeared pale and weak, and complained of general debility and loss of tone in the system, she had been confined some months before, and was then nursing a very large vigorous infant, the urine for some time previous to her application for treatment, had particularly attracted her attention; when seen then by me, it was of a pale milky appearance, and on cooling became gelatinous, and frequently was of more than usual quantity."

"This appearance of the urine had been noticed after former confinements while nursing; and had disappeared shortly after her children were weaned."

"I was of opinion, that a nurse should be procured for the child, when as on former occasions it was to be hoped, the

drain on the system being removed, the kidneys and other organs of the system generally would take on a more vigorous action. The patient being unwilling, however, for many reasons to give up nursing with the view of giving tone to the system, and if possible putting a stop to this unhealthy secretion from the kidneys, various tonics were used, as columba, and quinine. An occasional laxative of rhubarb and magnesia was at the same time used when necessary.

During this course of tonics, the patient had an attack of simple continued fever, which was treated in the usual way. Quinine and the muriated tincture of iron were again used; the infusion of gentian with quinine, the decoction of cinchona, and the mineral acids with a few alterative doses of blue pill occasionally, and a warm plaster to the loins were also latterly ordered. Port wine, and a generous diet, being at the same time the regimen adopted."

"As no effect, however, was produced on the appearance, and character of the urine, by the above treatment up to the end of January 1850, although the general health did not seem more impaired than at first, a change of air to Bangalore was advised; and I gave it as my opinion, that if after a fair trial of that change no benefit was derived from it, that the patient should at once give up nursing; when as on former occasions it was to be expected the kidneys, and other functions of the system would, with the aid of simple tonics, and a nourishing diet, take on their ordinary normal actions."

Mrs. R. having resolved to come to this place for further advice, a distance of about 60 miles, states that on the journey which occupied nine days, she suffered from a slight attack of fever, lasting one or two days, but says she is now in her usual good health. The bowels are said to be regular, and appetite pretty good, but it is always very moderate, or small; tongue clean, pulse 90, no unusual thirst, has no feeling of uneasiness in the region of kidneys or epigastrium, no night sweats, and sleeps well. The first specimen of the urine seen by me, was passed early in the morning, and was nearly as white as pure milk, and in moderate quantity.

This was accidently spilled. The next specimen obtained (passed also before breakfast) formed a thick, but not firm jelly, in the glass in which it was contained, and was of the same whitish appearance as the first; the only test applied to it, was a few drops of diluted nitric acid, which caused it to separate into a serum, having a firm coagulum in its centre. The patient was at once made to wean her child, and a course of tonic treatment recommended, the following mixture being given.

Rec. ferri. sulphatis 12 grs.
Aquæ 12 ozs.
Quinæ disulph. 18 grs.
Acid sulph. dil. 20 M.
Mix fiat mist. capt. 2 ozs. bis ter indie.

The bowels were kept regular by occasional small doses of her usual aperient (castor oil), and she was advised to be as much in the open air as possible, morning and evening. About the middle of April an opportunity offered of having the urine carefully analyzed; but the specimens then obtained, though still retaining the milky appearance, had a reddish brown tinge, evidently from containing a large admixture of healthy urine; these samples did not coagulate as before, though the patient herself declares, that the urine always forms a jelly when allowed to stand for some time without being agitated. Her answers to questions regarding her health, are still the same, viz., that it is very good, and that there is nothing particular the matter with her, beyond the condition of the urine. She, however, appears to me to have lost flesh, but neither she herself nor her friends (her father being an intelligent European Serjeant), perceive any change in that respect, and she is now anxious to be allowed to rejoin her family at Hoonsoor.

GEO. PEARSE, M. D.
Garrison Surgeon, Bangalore.

The following is the result of the analysis of the urine made by Surgeon J. E. MAYER.

EXPERIMENTS ON CHYLOUS OR CHYLO-SEROUS URINE.

The experiments to be detailed, were made at the request of Dr. Pearse, Garrison surgeon of Bangalore, who was desirous of ascertaining the real nature of the matters that imparted to the urine, passed by one of his female patients, the peculiar characters which have received the titles given in the heading.

The opportunity which thus occurred of making an examination of chylo-serous urine was eagerly embraced, as the case is not less interesting than it is rare, and as the want of circumstantial records of such examinations is admitted with regret by all the authorities on these subjects.

For the attainment of the object in view, it will at once be seen, that no extended analysis of the whole constituents of the urine was required, nor were any quantitative determinations needed.

The absence or presence of caseine, in any recognisable form, was the first point to be ascertained. The secondary points to be attended to, were the absence or presence of pus and phosphates, these being the only known bodies which when diffused through healthy urine, were likely to simulate or cause to be mistaken for urine, such as that about to be described.

The specimen of urine brought for examination, appeared of a dirty milk colour, resembling gum ammoniac mixture; its consistence somewhat thicker than milk, and its smell very faint; indeed the urinous odour was scarcely perceptible: Sp. gr. 1·013*

* These figures are something less than they should be, as the only water procurable at the time was rain, instead of distilled water: I ascertained that this water contained lime, magnesia, sulphuric and hydrochloric acids, although all these were present in exceedingly small quantities. I do not think, however, that the error can be great, as the sp. gr. found, does not differ much from those given by Dr. Prout, Dr. Bird and Dr. Rees. The sp. grs. in four cases, taken from the two latter authors are, 1·018, 1·020, 1·010 and 1·021—the mean of these, is 1·017; the mean of four instances given by Dr. Prout is also 1·017.

EXPERIMENTS.	RESULTS.	DEDUCTIONS.
(No. 1.) Portion of the urine placed on a filter of common bibulous paper.	Passed through, milky and unaltered, nothing perceptible being retained on the filter.	Absent, pus and mucus.
(No. 2.) Litmus paper immersed in the urine.	Became faintly reddened.	Absent, any strong alkali. The fear, that albumen if present might, when the urine was heated be held in solution by alkalies, was thus removed.
Turmeric paper immersed.	Remained unaltered.	
(No. 3.) Boiled per se in a flask, the contents then placed on a filter.	Remained on the filter, a copious white precipitate, on the surface of which there was some matter resembling fat.	Present, albumen, with some other matter to be further investigated.
(No. 4.) Filtrate from No. 3, which now appeared perfectly clear, like ordinary urine, having been collected in another flask, treated with strong acetic acid, guttatim.	No clouding—no precipitate—nor perceptible change of any kind.	Absent, probably caseine.
(No. 5.) Flask containing the filtrate from No. 3, plus acetic acid, exposed again to boiling temperature, for some minutes.	No opacity, nor appearance of any thing like curd.	Absent, caseine.
(No. 6.) Two parts of the urine, and one of æther, were placed in a stoppered phial which after being closed was briskly agitated two or three times for about half a minute.	The contents of the phial now became clear, dividing into three portions; two of which were fluid, the third semi-solid, this portion occupied a space in the phial, between the two fluid portions; the upper fluid was distinguished, not only by its position, but by the smell, as æther; its colour, however, was	Present, some fatty matter, previously combined with the semi-solid portion, but which was separated from it by the superior affinity of æther for such substances. Present, in the form of the semi-solid jelly-

	somewhat altered, it had now a faint yellow tint. The semi-solid portion was a tremulous jelly like coagulum. The third portion which occupied the lowest part of the phial, was urine as it usually appears.	like coagulum either albumen or Fibrine. This substance, when combined with the matter held in solution by the æther, forms the milk-like matter, that so disguises the urine.
After standing 3 weeks, the phial and contents were again examined.	No perceptible change had taken place, except that the upper, *i. e.* the ætherial portion of the contents of the phial had deposited a semi-crystalline matter much resembling stearine, on that part of the internal surface of the phial with which it was in contact.	The deposition of the fatty matter arose from the partial evaporation of the æther, the phial having been but very loosely stoppered.
(No. 7.) A small slip of blotting paper was rubbed against the internal surface of the phial, so as to become smeared with some of the matter deposited there.	The smeared paper when rubbed between the fingers, became partly transparent, as happens with paper substances.	Deductions from No. 6 confirmed.
(No. 8.) Portion of the urine treated with nitric acid in a test tube.	Copious deposition of a white flocculent precipitate.	Absent, phosphates. Presence of albumen confirmed.
(No. 9.) Portion of the urine placed in a stoppered phial, with some strips of lead and well agitated.	No deposition of coagula or filaments on the lead.	Absent, fibrine.

After an interval of three weeks, a second specimen of chylous urine, from the same individual, of precisely similar appearance, was obtained, the experiments made with the first, were repeated with the same results.

The details are therefore not given; the fact is mentioned merely as offering confirmation of those recorded.

The general deductions from all the experiments made, are:—

First.—The absence of caseine.

Second.—The absence of pus and phosphates.

Third.—The presence of albumen.

Fourth.—The presence of animal fat, which, together with the albumen, confers on the urine its milky appearance.

To test to the utmost (as far as the time and means at my disposal would permit) not only the truth of the above general deductions, but the delicacy of the direct method, an indirect mode of proof was employed; it consisted in treating artificial mixtures of milk and urine, by the method used in the examination of the chylous urine. In this case, if the previous deductions be correct, the results will be reversed. The first series of experiments were made with cow's milk and healthy human urine. The second series with human milk and healthy human urine.*

* These artificial mixtures were made to resemble in appearance, as much as possible, the chylous urine. The difference in the specific gravity, between the chylous urine and such mixtures, was not determined.

EXPERIMENTS.	RESULTS.	DEDUCTIONS.
(No. 1.) Two parts of milk and one of æther were agitated in a phial.	No clearing as in the case of the chylous urine; no effect, but that of being somewhat less white-looking as if diluted with water.	Absent, that matter which the æther takes up from the chylous urine.
(No. 2.) A mixture of cow's milk and healthy human urine, made as described agitated with a little æther in a phial.	No clearing whatever, escape of some gas with effervescence, the nature of which I had not time to examine.	Absent, the matter, which æther takes up from chylous urine.
(No. 3.) A fresh portion of healthy human urine and cow's milk mixed as before, amounting to about 4 ozs., boiled for some time, probably 10 minutes, after cooling filtered.	No precipitate, nor deposit of any kind in the flask. Slight pellicle on the surface formed while boiling. Except the pellicle above described not a trace of any thing on the filter.	Absent, any matter coagulable by heat except the pellicle which is a well known form of caseine.
(No. 4.) Filtrate from No. 3 treated with acetic acid a few drops.	Copious and immediate precipitate of white curdy matter.	Present, caseine.
(No. 5.) A mixture as before of cow's milk and healthy human urine, tested by litmus paper.	Scarcely any perceptible action, if any slightly acid.	Absent, any free alkali that could hold albumen in solution, had it been present.

From these experiments it follows:—

1st. That æther by simple agitation does not take up those parts of milk, which give it the well known white appearance.

2d. That when urine and milk are mixed, and agitated with æther, although a well marked action takes place, no clearing whatever ensues; the æther being in these circumstances equally incapable of taking up the particles that give to the mixture its peculiar appearance.

3d. That artificial mixture of cow's milk and healthy human urine will afford, by boiling, no trace of albumen, contrasting with the behaviour of chylous urine, under similar treatment, in a most striking manner.

4th. That although no trace of albumen could be detected by continued boiling (no uncombined alkalies being present in the mixture) an immediate precipitate of caseine follows on adding acetic acid to the boiled artificial mixture, and again boiling; this being exactly the reverse of what takes place when chylous urine is similarly treated, shewing in the one case, the total absence of caseine, and in the other the simplicity of its detection when present.

Previous to following out, the plan of proof which I had laid down for myself, I was desirous (never having previously experimented with human milk), of gaining such information as I could, relative to this kind of milk, and its behaviour with re-agents; with this object, I consulted all the chemical works in my possession. In by far the greater number nothing is said of peculiar kinds of milk, cow's milk being taken as the type of all; however in Professor Brandes 'Manual of Chemistry,' these passages occur: "its albumen or caseine (meaning that of human milk) is said to furnish *soluble* combinations with acids, so that it is not coagulated by them. Of fifteen samples, only three were coagulated by acetic and hydrochloric acids; &c.," see page 1361, Vol. II. of the fifth edition; and in Dr. Thomson's 'System of Chemistry' page 502 of the 4th Vol. sixth edition, are the following words :

"None of the methods by which the cow's milk is coagulated succeed in producing the coagulation of woman's milk," &c., Dr. Thomson quotes from Clarke, 'Irish Transactions,' II. 175.

Dr. Gregory, page 535 'Outlines of Chemistry' says, "If carefully neutralized by an acid, milk is not coagulated but it is then coagulated by boiling."

Dr. Turner in the eighth edition of his 'Elements of Chemistry,' though published two years later than Dr. Gregory's 'Outlines,' says not a word regarding the behaviour of milk in the circumstances under consideration.

After perusing these conflicting passages, I little doubted, that it would be necessary to seek for some new mode of proof; but being unwilling at once to abandon the method I had first proposed and so far pursued with the most satisfactory results, I obtained specimens of milk from three women, which I numbered 1, 2, and 3. A small portion from each of these was treated with acetic acid, only the portion from No. 2 gave a precipitate. The quantity of acid was increased gradually, with the two other portions, but without effect.

Another portion from each specimen, was treated with half its bulk of strong acetic acid, still only No. 2 gave a precipitate. Fresh portions of each specimen were *boiled*, and then small quantities of acetic acid were added to each, the effect being as before. Again, fresh portions from each were taken; acetic acid in small quantities added; all three were boiled, all three gave a precipitate, which remained in each case at the surface of the fluid. This slight difference in the mode of proceeding appeared to promise all I wished; but before proceeding further, I obtained 2 new specimens of human milk, neither of which gave a precipitate by the simple addition of acetic acid, but both readily did so after boiling. Not to take up more time by further details, it will suffice to state, that I treated eleven specimens of human milk obtained

from different females, in the manner above stated; of these, four gave a precipitate, by the simple addition of acetic acid, nine refused to do so; all readily afforded a copious precipitate by boiling, the acid having been first added. Sixteen specimens of human milk, obtained from different females, having now shewn the same behaviour, I had sufficient confidence in the method; but before trying its efficacy in the presence of urine, I was anxious to ascertain its delicacy; half a dram of human milk was therefore diluted with eight ounces of water, and 20 drops of dilute acetic acid added; the whole boiled. The reaction not being sufficiently distinct, I added 24 or 25 minims of the same milk, and half a dram of dilute acid boiled again; a copious precipitate, white and flocculent as usual, occurred. In an imperial pint of water at 62° there are 8750 grains, and in half a pint (the quantity of water used to dilute the milk,) 4375 grs., and in one dram of human milk, the sp. gr. of which does not vary much from that of water, there will be about 55 grs. Now the mean of three analysis quoted by Professor Brande, gives in 100 parts of human milk, two of caseine (or 2·25): from these data, it is evident that 55 parts will contain 1·23 grs. of caseine, and if, as the experiment proves, we can find 1·23 grs. of caseine in 4375 + 55 milk, + 50 acid, or 4485 grs. of fluid, the reaction is sufficiently delicate for all practical purposes, being in whole numbers one grain discernable in 3646 grs. Having thus removed an apparent obstacle to the intended method of investigation, I proceeded to make the following experiments:—

EXPERIMENTS.	RESULTS.	DEDUCTIONS.
(No. 1.) Two parts of human milk, with one of æther agitated in a phial.	No clearing whatever, the action being precisely similar to that with cow's milk.	Absent, that matter which the æther takes up from the chylous urine.
(No. 2.) An artificial mixture of human milk and human urine made as before, agitated with æther.	The action, in this case exactly similar to that with cow's milk.	Absent, that matter, which æther takes up from chylous urine.
(No. 3.) An artificial mixture of human milk and human urine, made as before, boiled, filtered.	No precipitate, slight pellicle on the surface of the fluid separated by the filter, the fluid passing through unchanged.	Absent, all traces of albumen; the pellicle, being as before observed, a form of caseine.
(No. 4.) The filtrate from No. 3 treated with acetic acid and again boiled.	A copious white curdy flocculent precipitate.	Present, caseine.
(No. 5.) A mixture as before of human milk and human urine, tested by litmus paper.	No perceptible action.	Absent, any uncombined alkalies, that could hold albumen in solution, had it been present.
(No. 6.) A mixture of healthy human urine 1 oz. white of egg 1 dr. mixed with $\frac{1}{2}$ oz. of water, and 2 drs. of human milk, boiled, and then filtered.	Opaque white preciptate, which, after the filtrate had passed through nearly clear, was kept on the filter.	Prescnt, albumen.
(No. 7.) To the filtrate from No. 6, added $\frac{1}{2}$ dr. of dilute acetic acid, the whole boiled, and afterward filtered.	White curdy precipitate after boiling some time. Precipitate left upon the filter.	Present, caseine.

Experiments 6 and 7 were repeated, with the serum of blood instead of white of egg, with precisely similar results. Before their bearing on this subject is noticed, the results of this series, as far as No. 5, when compared with those of the second series, shew that they are identical; confirmation stronger could not be desired. Both series shew, that caseine in either of the forms taken, is, in the presence of urine, easily detectable; consequently it would have been discovered, had it been present in either of the specimens of chylous urine examined. Experiments 6 and 7 show, that although there may be present also albumen in quantity, the caseine is still to be detected, while its presence in no way interferes with the detection of albumen; hence, it is evident, we can always be sure of detecting either of these bodies, or all, when present in urine. The detection of fibrin is less insisted on than that of the other two bodies, as the spontaneous coagulability of the urine, at once announces the presence of albumen in this form. But the facility of detecting fibrin, albumen, and caseine, all or singly, is not the only result of these experiments; henceforward no fraudulent mixture of milk with urine can pass without detection: the behaviour of such mixtures with æther, the absence of a precipitate by boiling a precipitate obtained by boiling after adding acetic acid, will immediately point out their nature. The popular opinion that chylous urine, in truth contains milk or the elements of milk, mixed with urine though controverted by many, is by no means so absurd as it may at first appear, nor is it altogether without the support of authority, the late Dr. Simon of Berlin says he has met with one species of urine in which the fatty matter existed with caseine, as an emulsion, forming in fact *true milky* urine. (See Dr. G. Bird's work on Urinary Deposits, &c., page 313, second edition.)

Dr. Prout the greatest English writer on these subjects, does not, unless I have overlooked the passage, positively state whether he believes that caseine in any form ever exists in this kind of urine; if however it be allowable to draw a conclusion in reference to this single point, from his general

doctrines, it would appear that he by no means considers such a thing impossible ; while speaking of nutrition, and the four principles he considers subservient to this purpose, he explains that under the head of the albuminous principle, he includes fibrin, albumen and caseine, and at page 123 of his work on stomach and renal diseases (4th edition) while describing the results of an examination of some chylo-serous urine, he says " the serous portion was white and opaque like milk, and on being heated and permitted to stand at rest for some time, threw up a substance, on its surface, very like the cream of milk, and which like cream was found to contain a considerable proportion of a buttyraceous or oily principle, and further on in the same page he states, it was not coagulable by heat though it contained abundance of albuminous matter; chiefly, however, in that state in which it exists in chyle and which I have denominated incipient or hydrated albumen. One hundred grains of this serous fluid evaporated to dryness, left about seven grains; half a grain of which only was soluble in alcohol, and consisted of urea, and a little fatty matter, and the other principles commonly found in all animal fluids, while the remaining six and a half grains consisted chiefly of the imperfect albuminous and fatty principles above-mentioned with some salts ; this residuum burnt with a flame, yielding an odour somewhat like that of cheese ; and left a coal difficult to incinnerate." At page 457 of the same work, this passage occurs, " moreover these staminal principles in all their forms are capable of passing into, and of combining with each other ; at least, the organic agents have the power of effecting such changes." There are several other passages, bearing on this subject, all leading to the belief, as I understand them, that the form of albumen which is called caseine, may exist in chylous urine ; it would however take up too much space and time to quote more largely.

All who are acquainted with the results of later researches on these substances (albumen, fibrin and caseine,) will see how strongly they all support the views of our late lamented

countryman, and without embracing in its extended sense, Professor Mulder's Proteine theory, will, no doubt, admit that he has proved a very striking resemblance, if not identity in these substances. The ultimate analysis of several of the best experimenters, though they have not in some points proved identity, have confirmed the striking likeness. Liebig (see Animal Chemistry, page 50) writes thus, "chemical analysis has led to the remarkable conclusion, that fibrin and albumen contain the same elements united in the same proportion;" again he says, "in these two ingredients of blood, the particles are arranged in a different order, shewn by their external properties, but the ultimate proportions are identical, this has been beautifully confirmed by Denis who has succeeded in converting fibrin into albumen, giving it the solubility and coagulability by heat, which characterize white of egg. By another process fibrin can be precipitated as a white mass, very similar to coagulated albumen or cheese." In addition to all these facts, we must not forget that in the urine of pregnancy there exists a compound, exhibiting, under certain treatment, all the properties of caseine. Dr. Bird in several instances noticed the powerful smell of putrifying cheese when this urine was kept, and Lehman obtained from it kiestein, buttyric acid. All the details just given, prove, that caseine (as well as fibrin and albumen) can and does sometimes pass into the urine; nor will its appearance in this fluid, seem on reflection, more surprizing than that of many other substances occasionally found in it; and if, as we have the strongest reasons for believing, all such abnormal appearances, indicate some diseased function or lesion, how necessary is it, that they should be carefully studied, and each particular one accurately discriminated? No one doubts that the well ascertained presence of albumen, sugar, phosphates, oxalic acid, or other abnormal product in a patient's urine, affords the greatest assistance in the treatment of disease; that in fact without this assistance, the treatment can be, but groping in the dark; how then is this assistance to be obtained, how is the absence or presence of

abnormal products to be well ascertained? The only answer that can be given, is, by chemical examination alone, and it is superfluous to remark, that the facility of making such examinations will go a long way to increase their number, and with their number, their value.

1*st July*, 1850. J. MAYER.

ANALYSIS OF THE SPRING WATER OF RAMANDROOG. BY J. E. MAYER, ESQ. PROFESSOR OF CHEMISTRY.

The appearance of this water has nothing in it very peculiar, but to a practised eye indicates when allowed to stand, the presence of iron.

Taste is peculiar, somewhat brackish and unpleasant, smell none.

It has a feebly acid reaction and is unfit for culinary purposes but not altogether unfit for washing with.

Sp. gr. found to be 0·9978 water being 1·000 at the temperature of 87° Fah.

The usual operations for qualitative examination having shewn, what bases and acids were present in this water, the following determinations of the quantities of each substance present were made.

10,442 grains of the water evaporated to dryness, dried in a water bath till it ceased to lose weight shewed a fixed residue of grains 2·50.

The fixed residue ignited in a platinum dish, showed a loss of 0·49 grain, which represents the organic matter present.

10,442 grains of water evaporated to dryness, and exposed to a temperature on a sand bath considerably above that of boiling water, and then extracted by dilute hydrochloric acid, the addition of which caused considerable effervescence, and washed on a weighed filter till the washings left no residue on platinum foil, shewed on weighing the filter and its contents (the tare of the filter deducted), the amount of silicic acid.

The iron was determined by precipitating the hydrochloric solution by liquor ammonia. The alumina and iron in the state of peroxide were thrown down, these two were separated in the usual way, both were then separately dried, ignited and weighed.

The alkaline filtrate from the above was treated with oxalate of ammonia, the whole of the lime present was then thrown down, accurately washed, dried, ignited and weighed, the weight represents the amount of carbonate of lime, from this the amount of lime is easily found.

It having been found by the qualitative examination, that the amount of magnesia present was too small to estimate, except on a very large quantity of water, the determination of the alkalies was at once proceeded with, and this was the more simple, as it had also been shewn that the potass contained was a mere trace; thus shewing that the weight of the chlorides found, might without any material error be calculated as sodium; this weight was found by evaporating to dryness, and subsequently maintaining the crucible at a temperature sufficiently high, to drive off the last trace of ammoniacal salts.

The sulphuric acid present, was in too small a quantity to be determined, until a much larger quantity of water had been employed, the chlorine was determined in the usual way as a silver salt. The total amount of carbonic acid was found, by adding to the contents of one bottle of the water chloride of calcium, and liquor ammonia, which in the presence of carbonates or free carbonic acid transpose thus:

$$NH_3 + HO + Ca\,Cl + CO_2 = Ca\,O, CO_2 + NH_4\,Cl,$$

the weight of carbonate of lime found, represents, when the base is deducted, that of the whole carbonic acid contained in the water. Part of this amount existed in the free state, and part in combination, the effervescence of the fixed residue when treated by dilute acid sufficiently proves this.

In order to ascertain the amount of gas, if any existed besides carbonic acid that was combined in the water, a flask

holding the contents of two bottles of the water was employed, a glass tube bent twice at right angles after having been filled with distilled water was fitted by means of a cork into the mouth of the flask, the further end was passed under a tube filled with potass ley standing over a trough containing the same; the water in the flask was then boiled, all the gases were thus expelled, the gas unabsorbed by the potash ley amounted to $1\frac{1}{2}$ c. i. and this calculated in the gallon = 10 c. i. The $1\frac{1}{2}$ c. i. of gas, tested by a lighted match appeared to be chiefly atmospheric air, but not pure.

The weights of each substance obtained from the amounts of water previously specified are as follows:—

Fixed residue 2·50 grains consisting of

Bases.		*Acids.*	
Organic matter,	0·49 grs.	Silicic acid,	0·30 grs.
Iron peroxide,	0·14 ,,	Chlorine,	0·34 ,,
Alumina,	0·20 ,,	Carbonic acid in combination with lime,	0·22 ,,
Lime,	0·33 ,,	Carbonic acid in combination with sodium,	0·05 ,,
Magnesia,	trace,		
Alkalies (inferred)	0·34 ,,		
Total	1·50 ,,	Total	0·91 ,,

The principle of chemical affinity taken in most cases as the guide in exhibiting how the bases and acids found were combined, seems in this water to be also that of the solubilities of the various compounds, and therefore the view given may serve to illustrate Dr. Murray's theory as well as that of the one more ordinarily followed in arranging results, for the chemical affinities and the solubilities of the compounds, *i. e.* in the presence of much free carbonic acid seem almost to coincide.

The weights found, calculated on a gallon of water with the acids and bases in combination as they are supposed to exist in the water are given below.

The fixed residue calculated on a gallon of water is found to be 16·75 grains.

Chloride of sodium, of potash a trace, 3·75 grains,
Carbonate of Soda, - - - 1·27 ,,

Carbonate of Lime, - - -	4·03	grains,
" of Iron, - - -	1·51	"
Magnesia, - - - -	a trace.	
Alumina, - - - - -	1·34	"
Silicic acid, - - - -	2·09	"
Organic matters, - - - -	3·20	"
Total. .	17·19	"

If the total weights of the substances combined be now compared with the sum of the fixed residue, it will be found that there is an excess of 0·49 grs., that is nearly half a grain; but it must be remembered that the iron is reckoned as proto carbonate, being originally in this form in the water, but during the evaporation it is transformed into peroxide, and as such forms a part of the fixed residue, the weight of peroxide found = 0·90 gr.; and if this be substracted from 1·51 the weight of the calculated carbonate of iron, we shall have to deduct the difference, *i. e.*, 0·61 from the sum of the combined acids and bases, which will then closely approximate to that of the fixed residue.

In order to form any judgment of the value of this water as a carbonated chalybeate, it is necessary to compare its constitution with that of other well known waters. Dr. Turner, Mr. Founes and others have in their chemical works given us some means of comparison; thus we find in those waters termed carbonated, various amounts of free carbonic acid independent of that found in combination as well as various amounts of iron; these again are found in company with such a great variety of salts in such various proportions, that it becomes a question of almost insuperable difficulty to institute a very rigid comparison. We find carbonic acid in various quantities in those waters called carbonated; in the instances of Püllva and Cheltenham waters, the amount is very similar to that found in the Ramandroog spring. There is no iron in the first of these springs, in that of Cheltenham more than is present in the Ramandroog water. Pyrmont contains a much larger quantity of carbonic

acid, though but a very little more iron than is found in the water of the Ramandroog spring. The more important ingredients may indeed be selected and compared but it would be rash to draw any positive inference as to medicinal value from such comparison, for it has been found that the presence or absence of ingredients supposed to be of little value has materially altered the effects of them; these facts are well known to those who manufacture artificial mineral waters.

Analysis has shewn the constitution of the Ramandroog water: it contains, though not in any large amount, both carbonic acid and iron, and it has also shewn, that it does not contain any deleterious substance, neither does it contain alumina or lime in any quantities that may be injurious, the first being present in little more than a grain in a gallon; while the latter in the form of carbonate does scarcely exceed four grains in the gallon. The consideration of these facts renders it evident that the Ramandroog spring is well worthy the attention of those who reside in its vicinity. To what extent it may be beneficial experience only can pronounce; there seems however to be no cause why it should not be quite as much so as a great many other springs which in Europe are in much repute.

MADRAS, *23d June*, 1851. J. MAYER, *Professor of Chemistry.*

CHEMICAL ANALYSIS OF CERTAIN INDIAN GRAINS, BY SURGEON J. E. MAYER.

To

DR. LORIMER,

Secretary to the Medical Board,

Fort St. George.

SIR,

I have the honor, according to my promise, to forward a sketch of the physiology of food, and to request that you will do me the favor, to lay it before the Medieal Board at your earliest convenienee, with the analytical paper despatched on the 21st instant, to which the present sketch is intended as an introduction.

In transmitting these papers, it is but justice to myself considering the time that has elapsed, sinee the investigation just completed was proposed to me, to state the chief causes which have delayed its execution.

In the execution of my task, I met with diffieulties I had not expeeted, and had no right to expeet, sueh for instance, as the softening of my combustion tubing, which caused the failure of four out of my first five eombustions, I overcame this diffieulty, by enveloping my tubes in copper. The liquor potassæ kindly sent up at my request I found to be sp. gr. 1·07 or nearly the right strength aeeording to the Pharmacopœia, but far too weak for my purpose; this eaused fresh failures and delay, and was remedied by putting stieks of potassa fusa into the ley till the proper sp. gr. was attained. Again, I found some of the hydroehlorie acid belonging to my private stores, and which I used in the first instanee to fill my nitrogen bottle, to eontain iron, although it had been warranted pure by a first-rate London House. Several of my determinations for nitrogen were vitiated from this eause. I tried the hydroehlorie aeid sent up for hospital use, it also contained iron, fortunately I possessed another bottle of hydroehlorie aeid which was free from this impurity and I was thus enabled to finish my most important determinations.

Many minor causes of delay I pass over and have only mentioned some of those that did occur, to exonerate myself from the suspicions of inattention to the wishes of the Board, and of want of zeal and energy in carrying them out.

I have the honor to be,
Sir,
Your most obedient Servant,
JOHN MAYER, Surgeon,
2d N. V. Battalion.

WALLAJAHBAD,
January 23d, 1851.

SKETCH OF THE PHYSIOLOGY OF FOOD.

For the first suggestions relative to the importance of nitrogen in alimentary substances mankind is indebted to Majendie, his views were subsequently confirmed by the elaborate and striking experiments of Tiedeman and Gmelin; they were however strongly denied by numerous writers who adhered to the older views, among these was Dr. Stark, who endeavoured to support himself on a non-nitrogenous substance (sugar) and thereby lost his life, thus affording an almost incontrovertible proof of the correctness of the opinions he had combatted.

From this time, indeed from the first announcement of Majendie's views, the attention of Chemists and Physiologists has been more or less constantly directed to this subject, each as his talent or opportunity allowed, contributing something to the general stock of information; even to name all these benefactors to science would occupy too much time, yet it is impossible in a paper like the present to omit some passing tribute to the memory of Gay Lusac: that great Chemist discovered that nitrogen was present in the seeds of the cerealia. This discovery led to searching investigations, to ascertain in what parts of grains the nitrogen was contained, and what were the peculiar composition and properties

of these parts; they were found to bear a remarkable similarity to the white of egg or albumen, and hence the general designation of these compounds as albuminous substances.

From this moment new facts brought forward by a host of able men, crowd upon the investigator so thickly that it is useless to attempt to discriminate individual merits or contributions. The results of all these labours, may be thus stated. Firstly, three forms of nitrogenous substances have been found both in animal and vegetable organizations, distinguished by the terms albumen, fibrin, and caseine. Secondly, that the chemical composition of these three substances, is almost identical. Thirdly, that when introduced into the living organism each is capable of being converted into either of the other forms.

Now the bearing of these results on the value of any kind of food, composed, or partly composed of albuminous substances, depends on a knowledge of certain laws that obtain in the living animal, and as these have no where been so lucidly explained or interpreted as in the animal chemistry of the great Philosopher of Giesen, a reference to his work is here almost indispensable. At page 48, third edition, he says while explaining and defining the term *food* "that only those substances can properly be called nutritious which are capable of conversion into blood." The principal ingredients of blood are found to be fibrin and albumen, and these substances contain also the carbon, hydrogen and oxygen, found in gum, sugar, starch and all kinds of food termed farinacious. Nitrogen, sulphur and phosphorus, and these elements are found in all the organized parts of the body, the only parts containing neither of these, are water and fat.

The striking facts just stated naturally lead to the inference, that the albuminous substances which contain all the elements required, and which are taken as food into the body, do furnish all that the blood (and structures made from it,) may need; unless the possibility of such bodies as nitrogen, sulphur, &c., being formed or eliminated by some secret pro-

cess in the living organism presents itself to the mind, and mingles doubt with the conviction that would otherwise follow. Such a possibility, did occur to the minds of many thinking men, and the doubts arising from it have only been dispelled by patient years of investigation. Liebig thus refers to the subject. "The most decisive experiments and observations have proved, that the animal organism is absolutely incapable of producing or creating an elementary body, such as nitrogen, sulphur, or phosphorus, it therefore inevitably follows that all kinds of food fit for the production of blood, *must* contain, sulphur, nitrogen, and phosphorus, in a soluble form." Now all the forms of vegetable albumen fulfil all these conditions. Vegetables in fact prepare in their own organisms, the food that is necessary to animals, and thus, is shewn the mutual dependence of the kingdoms of nature and a constant circulation of elements, which exist originally in an unorganized state in the mineral kingdom, are thence transformed by vegetables into organized substances, and in this state presented to animals, by whom they are again restored in an unorganized state to the kingdom from whence they were first taken.

The paramount importance of albuminous or nitrogenous substances, and the uses which they serve, being thus made evident, it remains to ascertain the uses of those alimentary substances which contain no nitrogen.

These kinds of food are composed of carbon, hydrogen and oxygen; the hydrogen and oxygen being in the proportion to form water, thus leaving the carbon wholly unoxidized; or if we suppose the oxygen to be divided between the carbon and hydrogen, a surplus of carbon and hydrogen that is unoxidized, remains. We are now speaking in reference to what takes place, after the food has been taken into the body, and there submitted to accumulation. How the carbon, or carbon and hydrogen are made use of by the animal, may be seen from the following facts.

From the moment an animal is born till it dies, oxygen is taken into its body through the skin and lungs, and given out

again by the same channels, in the form of compounds of carbon and hydrogen, *i. e.* as, the vapour of water and carbonic acid; that it is the carbon and hydrogen of the food, that enables the animal, with the oxygen inspired, to form and give out these products is proved, by what happens, when an animal is left without food. We see that in such circumstances its bulk and weight decrease till it dies, but until death takes place, it continues to take in oxygen and to give it out again in the form of carbon and hydrogen compounds. Whence then does it obtain the carbon and hydrogen thus given out? the wasting and decrease of weight answer plainly, from the tissues and other parts of its own body. The animal is in truth destroyed by the action of the inspired oxygen, on account of its powerful affinity for carbon and hydrogen, for when the animal has no longer any superfluous carbon and hydrogen capable of combining with the oxygen, it seizes on the carbon and hydrogen of the animals own body; in the first instance for example, the fat which is almost all carbon and hydrogen, is, to satisfy the oxygen, absorbed into the circulation, and after combination, given off as carbonic acid and water. These processes go on till the animal is exhausted and dies, it is therefore clear, that food containing a surplus of carbon and hydrogen is necessary to the animal in order to support *respiration* without destroying its structure.

At the same time, that this kind of food supports respiration and defends the organization of the animal from the action of the oxygen inspired, it fulfills another most important purpose, viz., that of maintaining *animal heat*, it does this, in obedience to a law so absolute and universal, that no exception is known, the law, alluded to, is, "That whenever oxygen combines with a combustible, *heat* is developed;" it matters not whether this combination be rapid or slow, or whether it be in or out of the body, heat is always developed, its influence even extends to the flowering of plants, the maturation of fruits, and the germination of seeds.

The operation of malting may be cited as a familiar

instance of the last effect named. The slow combinations of oxygen with combustibles in a finely divided state, have led to the destruction of ships, stocks, granaries, &c. &c., and are fearful illustrations of this law. The black powder of platinum or the sponge of the same metal condenses oxygen, and therefore, when hydrogen is thrown by the aid of a jet on either, combustion ensues; but it is needless to multiply instances, which might be adduced without number.

One important fact bearing directly on this subject, should not however be omitted. The temperature of the tropics when compared with that of the polar regions exhibits a difference of 50 or 60 degrees, yet the bodies of those who dwell in either climate are found to preserve the same amount of heat; it is therefore impossible that the temperature of animal bodies should depend on external circumstances, but must proceed from internal causes; what these are, has been already shewn, and how they depend on the supply of non-nitrogenous food.

The two grand uses to which food is adapted by its composition, having, by a reference to the composition of the animal structure, and some of the more important actions that take place in its organism, been traced out, the same mode of proceeding will be made use of to determine the purposes for which the remaining ingredients of food are available. These are the salts, viz., iron, phosphate of lime, chloride of sodium, with other salts of sodium, potash and magnesia. Here the inquiry is so simple that it will occupy a very brief space. Analyses of the blood, of the bones, and of the principal secretions, point at once to the uses of the salts, and shew the necessity of their presence. It is true that all the purposes to which the salts serve are not known, but enough is ascertained to prove that the blood, bones and the secretions, cannot remain in a normal condition without a constant supply, and therefore without overstepping the modesty of truth, the use, as well as the reason why these

inorganic ingredients are present in food may be said, to be ascertained.

From all that has been said, it will be seen that the business of the Chemist when analysing any kind of food with a view to determine its value will first be to separate the three kinds of ingredients, and subsequently to determine the quantity, in which each of these kinds is present.

ANALYSIS OF SOME OF THE GRAINS COMMONLY USED AS FOOD BY THE NATIVE INHABITANTS OF INDIA.

Rice, Raggee, Cumboo, Cholum.

The following analysis were made in reference to the ascertained uses of the different ingredients of food in general, and the results have been accordingly arranged under three heads, viz., nitrogenous, non-nitrogenous, and inorganic ingredients.

The grains selected for examination, were average samples of the last crops, and all obtained from the neighbouring bazaars.

After finely powdering a small quantity of each grain, the presence of the usual proximate elements contained in the seeds of the cerealia, was shewn by qualitative examination.

The following process was employed. From three to six grammes of flour was placed in a cotton bag composed of three layers of fine cloth, and kneaded under water, till the washing water gave no reaction with tincture of iodine; the water containing the starch was placed on filters; the filtrate was boiled down till the matter which was thus rendered insoluble (vegetable albumen) was capable of being separated by the filter. The filtrate was now still further concentrated; when about half an ounce remained, alcohol in equal bulk was added, a precipitate shewed the presence of gum; the whole was now evaporated to dryness in a water bath (to get rid of the alcohol), a little water added, gave a solution containing sugar salts and coloring matter; the sugar was detected by the reduction of oxide of copper to the sub-oxide and

the presence of the salts was demonstrated by igniting the residue obtained by evaporating to dryness half of the solution containing sugar, &c.; the husks remained in the bag used in the beginning of this examination.

To ascertain the nature of the salts present a larger portion of each powdered grain, was placed in a crucible and exposed to a bright red heat, which was kept up till some time after all evolution of gazeous matter had ceased. The charcoal thus obtained, after being powdered was treated with dilute H. Cl., copious evolution of carbonic acid; was afterwards digested several hours on a sand bath; the whole was then thrown upon a filter and finally extracted with water till all the soluble matters were withdrawn. The filtrate obtained, shewed the presence of the following bases and acids.

Bases.	*Acids.*
Iron, lime, magnesia, soda, potash.	Carbonic, phosphoric, sulphuric, and hydrochloric.

The last acid was obtained by employing a fresh portion of charcoal and exhausting with dilute nitric acid.

The following quantitative experiments were now made. A bag made for the purpose as previously described, and which had been washed in aqua distillata, till not a trace of starch was retained, was dried in a bath heated to 212° F. and accurately tared. A portion of rice finely powdered after being dried in the same way was placed in the bag and the weight of the whole taken. This gave by a giesen balance, sufficiently delicate to turn with the ten thousandth part of a gramme, 6·6002 grammes, for the weight of the rice employed. The bag with contents was now placed in a wide mouthed jar containing sufficient distilled water to cover the bag, the jar was then loosely covered to avoid dirt, and allowed to stand 6 or 8 hours. The bag with its softened contents was then kneaded under successive portions of aqua distillata till no trace of starch remained; to ascertain this, a portion of the washing water taken out by a glass rod, was tested by tincture of iodine. The bag was now taken out of

the starch water and carefully washed over it, then hung up to dry for a time and finally placed in a bath heated to 212° F. The jar containing the starch water was allowed, after being covered again loosely, to stand till all the starch had subsided; the clear supernatant fluid was then gently removed by a small beaker, and poured on a filter, several of which were required in consequence of the first used having become clogged up; these filters had all been dried and tared. After the starch on the filters had been well washed, the filters were all loosely covered and set in a warm situation to dry, finally placed in a water bath, after having been removed from the funnels, their edges folded over and set in separate small dishes. These filters after having remained twelve hours in the water bath, were perfectly dried. The weight of the starch they contained after having deducted the tare of the filters from the gross weight = 5·620.

The bag and its contents consisting of husks and matter adhering to them and insoluble in cold water, gave after deducting the tare of the bag from the gross weight 0·4350, for husk and insoluble residue.

The filtrate from the starch, containing all the matters soluble in cold water, was placed in a large dish and evaporated to dryness, the contents carefully washed into a weighed capsule and again evaporated in a water bath, to dryness, gave for the soluble matters 0·2770.

These figures shew a small loss, which from the nature of the process was inevitable.

$$5{\cdot}620 + 0{\cdot}435 + 0{\cdot}2770 = 6{\cdot}3320.$$

This loss nevertheless is by no means so great as to defeat the object of the experiment, when carried out into percentages, it amounts to something less than 4 per cent., while the experiment gives some insight into the composition of the grain, and will further serve as a safeguard against any serious error, when conducting more refined and delicate methods of research, which to a person, who is in a great measure shut out from all the records of chemical science,

and obliged to rely entirely on his own experience, is an advantage not to be overlooked; for these reasons, all the other grains were treated in the same manner.

The results are seen below.

Grain.	Starch.	Husk, &c.	Sol. residue.	Percentage.
Rice, - - - - -	85·1500	6·605	4·200	96·100
Raggee, - - - -	76·3121	11·831	9·421	95·577
Cumboo, - - - -	77·920	10·921	7·892	96·713
Cholum, - - - -	78·824	8·301	8·621	95·742

From these results it was obvious, that all the grains experimented on contained about $\frac{4}{5}$ of their whole weight of starch, or rather more of substances having a similar composition, if the gum and sugar be taken into account. To determine the exact amount of these substances which may all be represented by the formula $C_{12}\ H_{10}\ O_{10}$, two approved methods were open to me, viz., that of combustion, or that of loss of carbonic acid; as the latter appeared the easier, and as I should certainly be obliged to make some combustions, to determine the nitrogen, this was selected. It is founded on that discovery of Kirchoff which gained for him, an annuity of 1000 rubles while living, and since his death, a name which belongs to science, and which death cannot take from him, viz., that of acting on the grains in powder by some dilute acids, but especially sulphuric, which have the power, of converting starch, when assisted by continued boiling, into grape sugar, which has the formula $C_{12}\ H_{14}\ O_{14}$; the result therefore of the action which takes place, is the solidification of four equivalents of water, the conversion is known to have been effected when a rod dipped into the liquid, no longer gives the reaction with tincture of iodine. The grape sugar produced is then treated with a ferment first having been introduced into an apparatus, such as is used for the determination of carbonic acid but of larger size. The amount of ferment used must be exactly taken and subsequently that of the whole apparatus.

Another portion of ferment is to be introduced into another

flask, and the weight of this flask and contents taken with equal exactness ; it is also indispensably necessary that the yeast or other ferment, must be a portion of the same that was used with the grape sugar, and must also be put into the trial flask at the same time, and kept during the whole operation under precisely the same circumstances.

Both flasks will give off carbonic acid : after two days, both are weighed, and the weighing is continued every hour afterwards till the weight is constant. By deducting the loss shewn by the trial flask, from the larger amount shewn by the flask containing grape sugar, the loss attributable to the ferment alone is ascertained ; the loss above this denotes what is attributable to grape sugar and as every equivalent of grape sugar is equal to one of starch, it is easy to find what the loss of carbonic acid represents, for it is also known that one equivalent of starch, yields four of carbonic acid. To see how starch or its representative grape sugar yields four equivalents of carbonic acid it is necessary to take into consideration what the other products of the action of a ferment on grape sugar, are, and these are found to be two equivalents of alcohol and two of water. The reaction worked out according to the known formula of grape sugar and its products proves this to be the case, grape sugar is

	$C_{12}\ H_{14}\ O_{14}$	deduct one equivalent
of alcohol which is	$C_4\ H_6\ O_2$	there will remain.
	$C_8\ H_8\ O_{12}$	deduct one equivalent
of carbonic acid	$C_1\ \ O_2$	there remains.
	$C_7\ H_8\ O_{10}$	deduct one equivalent
of alcohol	$C_4\ H_6\ O_2$	there remains.
	$C_3\ H_2\ O_8$	deduct three equivalent
of carbonic acid	$C_3\ \ O_6$	there remains.
2 equivalents of water	$H_2\ O_2$	

From these figures, it is plain that four equivalents of car-

bonic acid represent one of grape sugar and one equivalent of grape sugar represents one of starch, therefore to find the amount of starch and the other ternary compounds of carbon, hydrogen and oxygen, contained in grain which are all expressed by the formula $C_{12}\ H_{10}\ O_{10}$ before given as that of starch, it is only necessary to convert the formula $C_{12}\ H_{10}\ O_{10}$ into figures, thus,

$$\begin{aligned} C &= 6 \text{ by } 12 = 72 \\ H &= 1 \text{ by } 10 = 10 \\ O &= 8 \text{ by } 10 = 80 \\ & \qquad\qquad\quad \overline{162} \end{aligned}$$

And at the same time to convert the formula for carbonic acid in a similar manner,

$$\begin{aligned} CO_2 \quad C &= 6 \qquad\; = \;\; 6 \\ O &= 8 \times 2 = 16 \\ & \qquad\qquad\;\; \overline{22} \text{ by } 4 = 88 \end{aligned}$$

because there are four equivalents of carbonic acid and therefore

4 equivalent of CO_2—1 equivalent of starch—the CO_2 lost—

$$88 \;:\; 162 \;::\; \quad : x$$

x = the starch required.

To explain the steps of this process, the data on which its accuracy depends, and the mode of working or calculating the results, has unavoidably occupied much paper and some time, but as these things are not to be found in ordinary works on analysis, it has been thought necessary, as otherwise it would be difficult for those not conversant with chemical details to follow the steps of the analysis, or to see the relation which the figures bear to the facts and results. Five sets of the necessary apparatus were set up all carefully marked by the file, the fifth being used as the trial flask. Having no yeast at hand, the ferment employed was toddy, to the use of which there appear to be strong objections, which it is not necessary to state now, but which are sufficient to deter me from using it in future.

Flask No. 1, *Rice.*

I. 5·1600 of finely powdered rice taken, after having been dried at 212° Fah., at the end of the operation, gave

II. Total loss of carbonic acid,	=	7·67
Loss due to the toddy,	=	5·24
Loss arising from grape sugar		2·43

5·1600 : 2·43 : : 100 : x

$x = 47·05$

88 : 162 : : 47·05 : x

$x = 86·61$ percentage of starch in rice.

Flask No. 2, *Raggee.*

I. 5·4801 grammes of finely powdered raggee taken after having been dried as above—

II. Total loss of carbonic acid,	=	7·28
Loss due to the toddy,	=	4·93
Loss from grape sugar,		2·35

5·4801 : 2·35 : : 100 : x

$x = 42·88$

88 : 162 : : 42·88 : x

$x = 78·93$ percentage of starch in raggee.

Duplicate determinations of starch in *rice* and *raggee* both failed, in consequence of the badness of the toddy employed. A third for each of these grains failed in consequence of accidents. Determinations for *cumboo* and *cholum* were after several attempts obtained, but the time taken up in obtaining them made it more advisable to verify them by making combustions, than by repetitions.

The abandonment of this process in no way militates against its beauty or its accuracy; it is scarcely exceeded in either, by the combustion, but without a sufficient supply of a strong and constant ferment which is available at all hours and which is not liable to be drank by servants or (to cover such practice) to be reduced by water, it is inconvenient.

Flask No. 3, Cumboo.

I. 5·89 grammes of finely powdered *cumboo*, after having been dried at 212°, and placed in the CO_2 apparatus shewed, at the close of the operation,

A loss of CO_2	= 7·15
The loss from toddy,	= 4·54
Loss of CO_2 from grape sugar,	2·61

5·89 : 2·61 : : 100 : x.

x = 44·31 percentage loss of CO_2.

88 : 162 : : 44·31 : x.

x = 81·47 percentage of starch.

Flask No. 4, Cholum.

I. 5·08 grammes of finely powdered *cholum* dried at 212° F. and placed in the CO_2 apparatus, shewed at the close of the operation,

A loss of CO_2	= 6·85
The loss from toddy,	= 4·62
Loss of CO_2 from grape sugar,	2·23

5·08 : 2·23 : : 100 : x

x = 43·89 per cent. loss of CO_2.

88 : 162 : : 43·89 : x

x = 80·78 percentage of starch.

The results of the foregoing determinations of the non-nitrogenous ingredients contained in rice, raggee, cumboo and cholum, being unconfirmed, except by those of the first process which was not expected to furnish more than approximations, claim no notice in this place they will hereafter afford a means of comparison.

The principles on which combustions of substances composed of carbon, hydrogen and oxygen depends, with all the steps in the manipulation, the cautions to ensure success, and all the points worthy of notice in this invaluable process, as well as the methods of calculating the results obtained by

it, are so admirably given in Tresenius' work on quantitative analysis, that it will be quite unnecessary for me, to do more, than to make such references as will serve to explain the results I have obtained. When substances having the composition stated above, are burned with free oxygen as in the original process of Lavoisier, or with other substances which readily afford oxygen, carbonic acid and water, are the results, and if these can be separately collected and weighed, the amounts of carbon and hydrogen can easily be calculated, as the composition of carbonic acid and of water is perfectly well known. The apparatus used to effect these ends, owes its perfection to Liebig; it consists of a tube of refractory german glass, containing no lead, which is drawn out at one end into a sealed point bent upward, to the open end, which during the operation projects beyond the furnace; a small tube containing chloride of calcium is fitted by the aid of a perforated cork, which must be air tight to both tubes, this tube retains all the water formed during combustion, but permits the carbonic acid to pass into a bulb apparatus partly filled with strong potash ley; this apparatus known as Liebig's bulbs is connected to the chloride of calcium tube by a caoutchouc connecter, this retains the CO_2. As one example of the required calculations will explain how all the results of the combustions to determine carbon and hydrogen have been obtained, that for the first of these operations is now given.

0·4450 grammes of rice flour which previous to taking the weight had been 12 hours in a water bath heated to 212° F. gave, after the combustion was finished, an increase of weight to the potash bulbs of ·7310 grammes; this is the weight of the carbonic acid formed by combustion; the chloride of calcium tube shewed an increase of ·2465 grammes which is the weight of the water formed. Now one equivalent of carbonic acid is represented (as before shewn) by 22. And the combining weight of carbon is 6, *i. e.* if we reckon by the hydrogen scale which is always used by English Chemists, therefore

one equivalent (contains) one equivalent of the carbonic *a*
of carbonic acid carbon obtained

22 : 6 :: ·7310 : x

x = ·1994 carbon in the amount of substance taken

0·4450 : ·1994 :: 100 : x

x = 44·80 the percentage of carbon.

Again the equivalent of water is 9 of which 8 is the oxygen and 1 the hydrogen, therefore

one equivalent of water the equivalent of hydrogen the water obtained

9 : 1 :: ·2465 : x

x = ·0274 hydrogen in the amount of substance taken

0·445 : ·0274 :: 100 : x

x = 6·15 percentage of hydrogen.

The values thus obtained, viz., 44·80 for the percentage carbon, and 6·15 for the percentage hydrogen, will be found in the results set down for the first combustion of rice. The other values have been calculated in the same manner. In substances composed of carbon, hydrogen and oxygen, it is almost needless to observe that if the sum of the carbon and hydrogen be known, the difference between this and the original weight of the substance burned, is that of its oxygen. It remains only to describe with as much brevity as possible, the principle on which combustions for the determination of nitrogen depend, when the nitrogen is not in the form of nitric acid, in which case this process, known as that of Varreutrapp and Will, is inapplicable; where the nitrogen as in the case of grains is found in the compound termed vegetable albumen it is admirably suited for its determination and depends on the fact, that when such nitrogenous bodies are ignited with the hydrate of an alkali-metal, the hydration water of the latter is decomposed so that its oxygen combines with the carbon of the substance undergoing combustion, while the hydrogen at the moment of its liberation goes to the whole of the nitrogen present. The hydration water is

best furnished by a mixture of caustic soda and lime which is prepared for this purpose and is known as soda-lime; this retains without deliquescing a sufficient amount of hydrative water even when made tolerably warm; thus giving the means of mixing it with the substance to be burned. The mixture is burned in a tube of german glass shaped as before mentioned, the end that projects from the furnace, is connected by a perforated cork with a bulb apparatus containing hydrochloric acid, which, on account of its strong affinity for ammonia, retains the whole of this gas, while it permits other gaseous products to escape. To afford a compound that will not suffer loss during evaporation, bichloride of platinum in excess is added, which forms with the chloride of ammonium, the double salt called the ammonia-chloride of platinum. The formula of this salt is $\underbrace{NH_4\,Cl,\ Pt\,Cl_2}$; now referring to the scale of equivalents it will be seen that this formula represents the numbers that follow,

$$
\begin{array}{lll}
N = 14 & & = 14 \\
H = 1 \text{ by } 4 & & = 4 \\
Cl = 35{\cdot}5 & & = 35{\cdot}5 \\
\hline
& & 53{\cdot}5 \text{ chloride of ammonium.} \\
Pt.\ 98{\cdot}68 & & = 98{\cdot}68 \\
Cl.\ 35{\cdot}5 + 2 & & = 71{\cdot}00 \\
\hline
& & 169{\cdot}68 \text{ bichloride of platinum.}
\end{array}
$$

And $53{\cdot}5 + 169{\cdot}68 = 223{\cdot}18$ the double salt; now this double salt contains as is shewn above, 14 parts by weight of nitrogen; therefore whatever weight of the double salt results from the operation, we can find how much nitrogen it contains, thus in the first combustion of rice to determine nitrogen it will be seen, that 1·2230 grammes gave at the conclusion of the process, 2932 grammes of ammonia-chloride of platinum, therefore

As one equivalent of the double salt	(holds) one equivalent of nitrogen	the double salt found.
223·18 :	14 :	·2932 : x.

will hold an unknown quantity of nitrogen which is represented by } x which = ·0184

The unknown amount of nitrogen being now found, the percentage is calculated in the usual way

If 1·2230 : ·0184 : : 100 : x

x = 1·542 the percentage of nitrogen contained in rice.

The nitrogen found in the seeds of the cerealia, it has been before stated, is in the form of vegetable albumen, which according to the best analyses published, has the composition here shewn. Three forms of albuminous vegetable compounds are given,

	Albumen.	*Caseine.*	*Fibrin.*	*Mean.*
Carbon,......	54·74	54·14	54·09	54·30
Hydrogen, ...	7·77	7·16	7·30	7·40
Nitrogen,.....	15·85	15·67	15·65	15·70
Oxygen, Sulphur, Phosphorus,	21·64	22·03	22·93	22·20
	100·00	100·00	100·00	100·00 nearly.

These numbers are taken from Gregory's Chemistry, and by him selected from the researches of Liebeg, Mulder and Dumas, but he expressly says, at random, thereby shewing the identity of composition in these substances, for it is evident from a glance at the numbers that they do not differ from each other, more than two analysis of one substance usually do. For this reason the mean of the three analysis has been found, and used to calculate what proportion of carbon, hydrogen, oxygen, &c., belong to the nitrogen found in each grain. The mode of calculating is sufficiently simple for if (taking the mean) 15·70 of nitrogen combine with 54·30 of carbon, then the amount of nitrogen found in each grain will combine carbon according to the same proportion, the same is also true with respect to hydrogen, oxygen, &c.; when these separate amounts which together form the vegetable albumen have been found, they are deducted from the

gross amounts of carbon, hydrogen and oxygen. The remainder of the carbon, hydrogen and oxygen, being known to exist in the form of substances having the formula $C_{12}\ H_{10}\ O_{10}$ a more exact method of calculating the amount of oxygen is obtained, for as before shewn, this formula converted into figures gives a total of 162 out of which 80 belongs to the oxygen, therefore by the aid of the carbon and hydrogen which have been found by combustion it is easy to find the required amount of oxygen. By these means the results of analysis, are made to exhibit in percentages, the amounts of nitrogenous and non-nitrogenous ingredients. By the percentage of the ash found by ignition, the amount of inorganic ingredients has been determined, and consequently the results of the whole constituents in percents., arranged according to the purposes to which they serve on entering the animal organism can be displayed at one view, and is thus shewn in the following Tables.

The order in which these grains stand, is not that of their comparative value, as articles of food, but that of the succession in which the analyses were made.

Several combustions to determine carbon and hydrogen were ineffectually made on account of the difficulty of completely burning the husk, although the grain was reduced to an almost impalpable powder, the difficulty was overcome by adding a small quantity of chlorate of potash which had been previously fused to get rid of every trace of moisture. Having no exhausting syringe the method of mixing was that of Bunsen, Mitscherlich, &c., a large glass tube having been drawn out and sealed for this purpose.

No. 1, *Rice.*

This grain was of the ordinary kind used by the natives, unboiled and of the last crop, obtained in the bazaar, Wallajahbad. A portion was reduced to an impalpable powder, placed in a porcelain dish and kept in a water bath heated to 212° Fah. for 12 hours.

4·1850 grammes dried as above and burnt in a platinum dish, left ·0202 grammes of ash.

0·4450 grammes after combustion with oxide of copper gave, ·7310 grammes carbonic acid, and grammes ·2465 water.

Second combustion 0·7320 grammes gave after being burnt in the same way, 1·205 grammes carbonic acid and ·3602 grammes water.

1·2230 grammes, burnt with soda lime gave grammes ·2932 ammonia-chloride of platinum.

Second combustion 1·5505 grammes burnt as above gave ·3301 grammes ammonia-chloride of platinum.

These determinations correspond, when expressed in percentages to

Carbon,......	44·87	The mean of the determinations is taken to calculate these percentages.
Hydrogen,...	5·85	
Nitrogen, ...	1·43	

Calculated from the mean of the analysis of vegetable albumen by the aid of the nitrogen found, the albuminous ingredients in this grain are,

Carbon,......	4·97	9·08 nitrogenous ingredients.
Hydrogen, ..	·67	
Nitrogen,.....	1·43	
Oxygen Sulphur, &c.	2·01	

Calculated from the carbon and hydrogen found, after deducting carbon, hydrogen and oxygen for the above.

Carbon,......	39·90	89·08 non-nitrogenous ingredients.
Hydrogen, ..	5·18	
Oxygen, ...	44·00	
Percentage of ash found,....		0·47 inorganic ingredients.
Total percentage..		98·63

No. 2, Raggee.

This grain was obtained from the bazaar of Wallajahbad, was of the last crop, and an average sample of that used by

the native inhabitants, was powdered and dried by the same method as the former grain.

4·5600 grammes of the dried raggee flour after ignition gave ·0472 grammes of ash.

0·6242 grammes after combustion with oxide of copper and chloride of potash, gave 1·1051 grammes carbonic acid, and ·3470 grammes water.

A second combustion of ·5625 grammes gave ·9424 grammes carbonic acid, and ·2152 grammes water.

0·6760 grammes burnt with soda lime, gave ·3091 grammes ammonia-chloride of platinum.

A second combustion of 1·2510 grammes with soda lime, gave ·5995 grammes of ammonia-chloride of platinum.

A third combustion of ·6220 grammes with soda lime, gave ·2701 grammes of ammonia-chloride of platinum.

These determinations give the following percentages: —

Nitrogenous ingredients calculated from the Formula for Vegetable Albumen by the aid of the Nitrogen found.		Non-nitrogenous ingredients after deducting the portions belonging to the Nitrogenous.		Inorganic ingredients incorporated with former, shewing the Total percentage.	
Carbon, - - -	9·88	Carbon, - -	35·76	Ashes, - -	1·03
Hydrogen, - -	1·34	Hydrogen, -	4·76		
Nitrogen, - -	2·86	* Oxygen, -	39·73		
Oxygen, - - } Sulphur, &c. - - }	4·04				
	18·12		80·25		99·40

No. 3, Cumboo.

This grain was likewise obtained from the bazaar of this place, and was an average sample of the last crop. It was powdered and dried, as the former grains were.

3·621 grammes after having been burned as before, yielded, 0·0464 grammes of ash.

0·6421 grammes after combustion with oxyd of copper and chloride of potash, gave 1·0532 grammes carbonic acid, and 0·3704 grammes water.

* Calculated from the formula $C_{12}\,H_{10}\,O_{10}$.

A second combustion, of 0·3852 grammes gave 0·6250 grammes carbonic acid, and 0·2315 grammes water.

0·7640 grammes burned with soda-lime, gave 0·2580 grammes, ammonia-chloride of platinum.

A second combustion of 0·5281 grammes burned with soda-lime, gave 0·1805 grammes ammonia-chloride of platinum.

These determinations give the following percentages :—

Nitrogenous ingredients calculated from the Formula for Vegetable Albumen by the aid of the Nitrogen found.		Non-nitrogenous ingredients after deducting what belongs to the Nitrogenous portion of the Grain.		Inorganic ingredients incorporated with the former, shewing the Total percentage.	
Carbon, - - -	7·59	Carbon, - -	36·89	Ashes, - -	0·73
Hydrogen, - -	1·03	Hydrogen, -	5·40		
Nitrogen, - - -	2·19	*Oxygen, -	40·98		
Oxygen, - - } Sulphur, &c. - - }	3·11				
	13·92		83·27		97·93

No. 4, *Cholum.*

This grain like all the others, was obtained from the bazaar of this place, was an average sample of the last crop, and was powdered and dried in the way previously stated.

3·0152 grammes after having been burned as before gave 0·0382 grammes ash.

0·4853 grammes after combustion with oxide of copper and chlorate of potash, gave 0·8123 grammes carbonic acid, and 0·2708 grammes water.

A second combustion of 0·7051 grammes, gave 1·1825 grammes carbonic acid, and 0·4012 grammes water.

0·7340 grammes burned with soda lime, gave 0·2741 grammes ammonia-chloride of platinum.

A second combustion of 0·5800 grammes gave 0·2334 grammes ammonia-chloride of platinum.

* Calculated as before from C_{12} H_{10} O_{10}.

These determinations give the following percentages:—

Nitrogenous ingredients calculated from the Formula for Vegetable Albumen by the aid of the Nitrogen found.		Non-nitrogenous ingredients after deducting what belongs to the Nitrogenous portion of the Grain.		Inorganic ingredients incorporated with the former shewing the Total percentage.	
Carbon,	8·47	Carbon,	37·22	Ashes,	1·26
Hydrogen,	1·15	Hydrogen,	5·09		
Nitrogen,	2·45	*Oxygen,	41·36		
Oxygen, Sulphur,	} 3·46				
	15·53		83·67		100·48

A view of the results of the analyses of all four grains is shown below.

Grains.	Nitrogenous Ingredients.	Non-nitrogenous. Ingredients.	Inorganic Ingredients.
Raggee,	18·12	80·25	1·03
Cholum,	15·53	83·67	1·26
Cumboo,	13·92	83·27	·73
Rice,	9·08	89·08	0·47

The grains are here arranged according to their respective capacities for forming the fibrin and albumen of the blood, by which their respective powers, as affording nourishment can best be judged of.

Being anxious that this paper should not be longer delayed, I have left some points connected with this most interesting inquiry uninvestigated. I shall, however, without loss of time bestow my attention upon them. The first of these is the exact amount of husk belonging to each grain, as this though taken into account in the combustions for carbon and hydrogen (and very properly so), necessarily exalts the percentage of non-nitrogenous ingredients beyond that which is available for the support of respiration and animal heat, for we know that in almost all instances these husks pass out of the system nearly unaltered. The deduction (when found) that must be made for the husk will most probably bring the results obtained by the loss of the carbonic acid process, as

* As before.

near as can be wished to those obtained by combustion. The second point which claims further attention is the amount of phosphates present in the ash of each grain.

In conclusion, it may be remarked that though rice holds the lowest place when taken as the only food of an animal, yet if it should form only a part of that food and the remainder consist of meat, eggs, milk or other albuminous matter, in such proportion that besides the amount of non-nitrogenous substances, the whole food contains a sufficient proportion of albuminous or nitrogenous matters, rice may be as useful as any other grain, it is only when viewed as the sole food of an animal that it will hold the lowest place as an article of nourishment.

REMARKS ON THE EXTERNAL USE OF CHLOROFORM, BY SURGEON J. KELLIE.

1. It appears to me not a little surprising that the external application of chloroform should not have been sooner and more generally resorted to in the cure of disease, when we were so well acquainted with its local action on the sentient nerves, it, I think might have been expected that the practical physician would at once have perceived the peculiar value of such a medicine as an external agent and the extensive use to which it might be applied in alleviating suffering, and essentially contributing to the cure of some of the most painful affections which humanity is subject to; but such has not been the case, for with the exception of a few isolated cases of neuralgia and chorea, there is no record that I am acquainted with informing us of chloroform having been generally used as an external agent in the cure of nervous diseases, while in my hands and in those of Drs. Shaw and Sanderson, it has been attended with the most successful results.

2. In many of the cases in which chloroform was resorted to, the neuralgic affection was local while in others it was only an external manifestation of some latent internal dis-

order requiring in addition to the anæsthetic agent, the administration of other remedies, but in every case immediate relief was obtained by the application of the remedy in question, and in many instances the affection was entirely removed. It seemed capable of removing permanently the morbid condition of the nerves on which the pain depended.

3. The manner in which I have used chloroform has been in the form of liniment combining it in the proportion of one part to 2, 3 or 4 of soap liniment, lard or olive oil, and having the parts affected well rubbed two or three times a day, and I have always observed that the more completely the pain could be removed and the longer the effects of the anæsthetic agent could be kept up, the more certainty there was of a cure being effected. In many cases the effects of the remedy was magical, the pain which a few minutes before had been agonizing, was immediately removed and never returned.

4. The following are the diseases in which I have used chloroform externally.

Spinal Irritation.—I have been more successful in curing this painful and generally obstinate disease than any other, and that too after I had used every other means for its removal, leeches, tartar emetic ointment, blisters, the hot iron opiate frictions, and all the remedies usually given internally in such an affection. The effects of the chloroform were immediate and complete. The symptoms seemed to be caused by local irritation, or a morbid exaltation of sensibility and which the sedative effects of the chloroform at once removed.

Otitis and Otalgia.—In both these painful affections I have applied externally chloroform with great advantage, it never failed to afford relief; but of course when there was inflammatory action present, other means were necessary for the cure of the disease.

Rheumatism and Rheumatic Gout.—In several dispensary patients affected with rheumatism and rheumatic gout, chlo-

roform liniment rubbed on the affected joints always afforded great relief and often secured a good night when opiates exhibited internally failed to do so, and thus it assisted in no small degree in the recovery of the patients.

Epilepsy.—In a case of epilepsy (an inmate in the female asylum) I have often had an opportunity of witnessing the effects of chloroform, when applied to the spine; it invariably abbreviates and lessens the violence of the paroxysm, and thus prevents the exhaustion and aggravation of the disease which a paroxysm unrestrained is liable to produce ; I feel pretty confident that if the patient in question could give intimation of the approach of the attack, the convulsive symptoms might be almost entirely prevented by the application of the chloroform.

Tetanus.—In two cases of tetanus in which the chloroform was applied to the spine good effects were always produced, the convulsions were immediately restrained and the patients always seemed much relieved after each application, one of the cases proved fatal ; in the other (case attached) the patient recovered but in her case the chloroform was also used by inhalation as well as externally and with the best effects.

After-pains.—It has been considered bad practice to administer any remedy for the removal of after-pains however acute the sufferings of the patient may be, seeing that they are but a symptom of uterine contraction endeavouring to get rid of some offending matter which if allowed to remain would eventually cause mischief. It is therefore the contraction of the uterus that is not to be interfered with, and the inhalation or external application of chloroform in no way interrupts that sanatory process. In several cases in which I have used it (rubbing the sacrum well with the liniment) the after pains immediately disappeared, in one case a second application was necessary but in the others perma-

nent relief followed the first application of the remedy, and all the patients made good recoveries.

Catalepsy.—In only one case of catalepsy has the remedy been employed and immediate cessation of the symptoms peculiar to the disease followed its application.

The patient is still in hospital but suffering only from weakness.

Irritable Breast.—Two cases of this affection both patients being far advanced in pregnancy, were treated with chloroform; in the first case Mrs. R—— the pain was agonizing, and before I saw her leeching, opiate frictions, &c. had been used without affording any relief; the chloroform entirely removed the pain within a few minutes of its application. The other case was equally successfully treated by the same remedy.

Pleurodyne.—In August last, Captain L—— was attacked with all the symptoms of pleurodyne, I treated him first by opiate frictions, mustard poultices, &c., without affording permanent relief, the pain always returning whenever the effects of the remedies had ceased to act; I had then recourse to chloroform which afforded immediate relief; and by applying it morning, mid-day and at night, the affection was completely cured.

Tic Doloreux.—In only one case of this affection has the remedy been used, but it was attended with the best effects; the patient had been suffering from attacks of this painful disease for some months, became worse in July last; opium and belladonna, fomentations and constitutional treatment were resorted to without much relief, but that was immediately obtained by applying the chloroform liniment and the pain has never returned.

Colic.—In a case of severe colic resembling enteritis in many of its symptoms, nothing afforded the patient so

much relief as rubbing the abdomen with chloroform liniment; it removed in a great degree the acute pain, and the patient was kept quite comfortable for hours after its application while other means were being used for the permanent cure of the attack.

I have also used the remedy in Dysmenorrhœa, (rubbing the sacrum with liniment) lumbago, and rheumatic affections of the extremities of old people with advantage, and I should expect that in infantile convulsions its application to the spine would prove of the greatest service.

Abstract of Cases of Persons treated by the External Application of Chloroform.

NAMES.	AGE.		Sex.	Diseases.	Abstract of Cases.	REMARKS.
	Years.	Months.				
Mr. M. - - - -	42	—	M	Spinal irritation.	Had been attending Mr. M. for spinal irritation for upwards of a year, the symptoms were confined to the superior portion of the chord and often severely affecting the muscles of the throat and neck, the disease advanced downwards, and he was suddenly seized with excruciating pain about the diaphragm and all the muscles of the chest were severely affected, causing urgent dyspnœa, he had several attacks of the above description coming on without any warning or any apparent cause.	Leeches, warm bath, tartar emetic ointment, opiate frictions, and antispasmodic were used and always with temporary benefit; but the disease was never removed, when chloroform liniment to the spine was applied and immediate relief followed, and by continuing the remedy occasionally, I have entirely prevented any return of the affection.
Miss D. - - - -	20	—	F	Spinal irritation.	Had been long affected with acute pain in the back and great weakness, the pain occasionally running along the nerves of the neck, chest and left arm, giving her great distress and quite unfitting her from attending to any duties, confining her almost entirely to bed, she became emaciated and depressed in mind.	All the remedies as described in the case above, with the addition of the heated iron were used but without any permanent good effect. At last chloroform was resorted to and the very first application gave her immediate relief; she was enabled to walk about; under the daily use of the remedy and

						the exhibition of some mild tonics, she rapidly recovered.
P. Wight, - - - -	22	—	M	Rheumatism.	Has severe pain about the right shoulder joint and is quite unable to raise his arm, attributes it to an attack of rheumatism which came on, two days ago, slight heat about the joint, but no swelling.	Chloroform liniment was rubbed all over the joint and the pain immediately disappeared, and he was quite able to raise his arm and use it freely.
Poonamah, - - -	30	—	F	Spinal irritation.	Complains of pain all along the spine but more particularly about the superior portion of it which is aggravated on pressure, the muscles of the neck are a good deal affected, with a feeling of tightness and occasional spasms. Has been ill for about a month.	Chloroform liniment was as in the above case applied, and relief followed the application of the remedy and the symptoms were entirely removed at the end of the third day when she was discharged.
Caussem Saib, - - -	13	—	M	Do.	Has for some months complained of acute pain in the left shoulder and upper part of the dorsal vertebræ, shifting occasionally to other parts of the body, and pressure about the spinal column aggravates all the symptoms.	Chloroform liniment rubbed along the spine gave immediate relief, and a few applications of the remedy seemed entirely to remove the affection. He came back to the Dispensary about a month afterwards complaining of a slight return of pain and had his back again rubbed with the same good effect.
Mr. H. Hogg, - - -	46	—	M	Rheumatic Gout.	This patient has for the last six years been a severe sufferer from rheumatic gout, chiefly affecting the lower extremities, and every description of medicine has been used to remove the disease and afford him relief, in vain.	Latterly during the paroxysm nothing seemed to afford him relief, till he used the Chloroform liniment which gave him immediate ease, and he states that he has derived more benefit from it than from any remedies he has ever tried.
Mrs. Campbell, - - -	30	—	F	Tic doloreux.	Has been complaining for the last four months of a shooting pain in the right	Opium and extract belladona, were applied over the cheek, and the

NAMES.	Age. Years.	Age. Months.	Sex.	Diseases.	Abstract of Cases.	REMARKS.
					cheek extending up to the forehead—there is no swelling or heat in the part, all the symptoms have become worse since the last week.	metallic tonics given internally—with little or no benefit, the chloroform liniment was rubbed over the parts affected and it entirely removed the pain, which has not since returned.
Miss L. Zscherpell, - -	17	—	F	Spinal irritation.	A weak and emaciated young woman—complains of having had a dry cough for the last two years, pressure being made on the 5th and 6th dorsal vertebræ causes acute pain.	The chloroform liniment afforded relief to the spinal column and the cough gradually disappeared and her general health improved.
D. Clarkson, - - -	14	—	M	Spinal irritation.	Complains of acute pain in the lumbar vertebræ, is unable to get up the steps of the Dispensary or bend his body forwards	The chloroform liniment was rubbed over the parts for five minutes, he was relieved immediately. The liniment was repeated in the evening and the pain, quite left him.
J. Richardson, - - -	5	—	M	Otitis.	Has been ill for the last three days. The right ear is swollen, and very painful to the touch, there is a slight discharge from the ear, no heat about the parts.	The chloroform liniment was rubbed twice, (morning and evening) and the pain was quite removed. Blister and other remedies were used for the removal of the discharge.
Mrs. C. Gordon, - - -	23	—	F	Irritable breast.	Complains of acute lancinating pain in the left breast which is much swollen and very painful to the touch, symptoms of two days duration. Is four month's pregnant.	The chloroform liniment was rubbed in for about five minutes when the pain was entirely removed and did not return.

Mrs. S. Rodrigues, - -	21	—	F	Irritable breast.	Is seven months pregnant, the first child, both breasts much enlarged complains of acute pain, symptoms of five days duration, no sleep at night.	Leeches, fomentations, diaphoretics, purgatives,&c., were resorted to but gave no relief, chloroform liniment was then applied which afforded almost immediate relief and two applications quite removed the affection.
Minche, - - - -	5	—	F	Tetanus.	27th June, 1850.—Admitted with all the symptoms of tetanus, body convulsively bent towards the right side, the mouth twisted in the same direction, jaws fixed, the slightest touch increased the spasmodic action. Symptoms came on this morning and without any apparent cause.	The bowels were endeavoured to be acted upon by strong turpentine and assafœtida enemata with the elastic tube, but without effect—when chloroform liniment was well rubbed over the spine, which in a very short time relieved all the spasmodic symptoms; 20 minims of chloroform were then given by inhalation and the liniment was again occasionally resorted to and effectually prevented any return of the spasmodic symptoms. A purgative was administered and 3 leeches applied to the head; a slight cough and some trifling febrile symptoms which followed the above attack retained the patient in hospital till the 18th of July when she was discharged,—cured.

J. KELLIE,

Surgeon 2d District.

MEDICAL REPORT OF THE 8TH REGIMENT N. I. FROM THE 1ST OF APRIL 1850, TILL THE 31ST JANUARY 1851.

Miscellaneous Observations.

In compliance with a Division order by General Dyce, commanding the Northern division, I proceeded on the 20th January in medical charge of the 36th regiment (head quarters and right wing) towards Russelleondah; and was subsequently appointed zillah surgeon, Rajahmundry; which appointment effected my removal from the 8th Regiment. It is my duty, therefore, to draw up a report for the regiment for the period during which I held medical charge, which in fact constitutes nearly the whole of the official year; and although my removal from the regiment may be virtually dated from the 20th January, it appears to me better that I should include the whole of January in this report than a broken period of the month.

The stations occupied during the period which this report embraces then are as follows:—

From April till the 13th December, 1850,	Secunderabad.
From 14th December 1850, till 14th January, 1851,	En route from Secunderabad to Samulcottah.
From 15th Jan. till the close of the year,	Samulcottah.

The average strength of the corps for the period including Native Commissioned and Non-Commissioned Officers and Privates,	820
Admissions from all diseases, including those remaining on the 31st March, 1850,	475
Deaths including 9 cases from epidemic cholera in the Left Wing en route to Samulcottah, of which I was not in medical charge,	21
Shewing a percentage of admissions to strength of,	58·49
,, of deaths, ,, ,,	4·42

Of the 21 deaths noted above there occurred from

Cholera,	9
Beriberi,	4
Pneumonia,	1
Phthisis,	1
Dysenteria Ac.	1
Apoplexia,	1
Anasarca,	1
Dyspepsia,	1
Erysipelas,	1
Diabetes,	1
Total	21

Though I must here remark that the cases of "anasarca" and "dyspepsia" terminated in beriberi; so that in reality the latter disease destroyed six patients and constituted exclusive of cholera half of the fatal cases for the period. I have some remarks to offer in another part of the report on this affection.

The medical officer in charge of the regiment at the close of the official year, will, of course furnish all the information called for under the heads of "Average Strength of the corps for the year"—"Duty and Employment," &c. &c., I shall therefore confine my remarks to the principal classes of diseases which have effected the efficiency or mortality of the regiment up to the date of my relinquishing medical charge, previously however giving a short sketch of its medical history, from the period of its leaving Secunderabad till the date of its arrival at Samulcottah. About the 7th of December 1850, the regiment was ordered to hold itself in readiness to march by wings; the right wing and head quarters on the 14th and the left wing on the 21st of the month, and in accordance with these orders the right wing and head quarters marched out of Secunderabad (strength as per margin) in all about 1904 souls under the command of Lieutenant Colonel N. Clarke; the left wing including the sick of the right wing unable to march, being left under the command of major Wight, and medical care of Dr. McDonald, 45th Regiment. The head quarter wing had a most prosperous march; three casualties only among the camp followers being reported; one of which occurred in hospital from cholera, and created some uneasiness, lest it might prove to be the first case of an epidemic visitation of that fearful disease. The regiment marched off its ground each day sufficiently early to avoid exposure to the sun after eight A. M.; the hours of marching being regulated by the length of the stages, which were made as short as possible, the principle followed out being

European Commd. Officers,	7
,, Non-commd. ,,	2
Native Commd. Officers,	9
Non-Commd. Officers and Privates, - - - -	366
Public Followers, -	20
Camp ,, - -	1,500

short marches and few halts; a system which had my cordial support, since it ensured a sufficiency of rest, that safeguard against the most predisposing of all predisposing causes of sickness, fatigue. Every care was also taken to select high and dry encamping grounds and every attention paid to the comfort of the men, especially in aiding the progress of their bandies containing their families and domestic comforts; which enabled them to reach the encamping ground shortly after the regiment; and ensured the men obtaining their first meal at an early hour in the day, a matter of no small moment in a sanatory point of view. Samulcottah was reached on the 15th of January; the men marching in, in high health, spirits and efficiency; and on the 20th as stated on the opening of this report, I proceeded with the 36th regiment towards its destination, and virtually terminated my connection with the regiment. The left wing which followed in our footsteps was not so fortunate. Cholera prevailed, from which disease, nine casualties occurred swelling the list of fatal cases for the period embraced in this report to twenty-one.

Remarks upon the Principal Classes of Disease.

The prevailing diseases have been fevers of the intermittent type, dracunculus and beriberi; the latter disease as I have before shewn, constituting (exclusive of cholera) exactly one-half of the fatal cases. The fevers were all of a tractable nature; yielding readily to the usual antiperiodic remedies, and I should offer no remarks upon this class of disease, but that it will appear in a subsequent part of the report, that beriberi in some instances follows upon febrile affections of an intermittent type, and which were treated as agues; but which I have now reason to believe and shall elsewhere attempt to prove were associated with, and symptomatic of sub-acute inflammation of the kidneys.

The admissions under the head of dracunculus, were very numerous, and there can, I think, be no doubt, but that the prevalence of the disease in the regiment was owing to its

locality upon the margin of the Hussain Saugor tank on low ground. The 19th regiment similarly situated though in an opposite side of the same piece of water also suffered severely and in the 8th regiment the greater number of admissions occurred during the rainy months, viz., July, August, September and October. The question whence are these entozoa (the dracunculus or filaria medinensis) derived? has often been asked, but never satisfactorily answered. The doctrine of spontaneous or equivocal generation having been satisfactorily disputed and the fact that "the different kinds of entozoa are not parentless animals; but that they in some way find their way into the body from without" established, it becomes an interesting inquiry in what medium and under what form these filariæ exist previous to their introduction; and to the investigation of this point some of my leisure hours were devoted. Various samples of the water of the tank and wells were examined by the microscope; but without any results. On one occasion however I was fortunate enough to extract a worm from a patient which after extraction evinced evident signs of life. It was placed in a bottle of fresh cold water which was carefully examined under the microscope. For some hours nothing was to be noticed; but presently the water became turbid and myriads of small thread like animals made their appearance, barely discernible by the naked eye; but clearly by a common lens, they were in a very lively motion. A drop or two of the water was now examined under a high magnifying power; and the little thread-like animals were resolved in perfect worms, and which certainly warranted me in assuming that they were the ova of the dracunculus, they were visible for some days; but did not attain any further development and soon died; the water becoming putrid. I would ask the question. Had one or more of these filariæ been inserted into the cellular tissue might they not there have acquired a development which they failed to obtain in the water? or in other words, may the guinea worm not find in the cellular tissue certain conditions necessary to its development; without which it can

never acquire its perfect organization; but perishes in the germ.

I have now to offer some remarks upon that obscure and fatal disease *Beriberi*. After a careful study of the affection as treated of in books and an earnest investigation of its phenomena at the bed side I feel as much at a loss to account for the symptoms, or to stay the progress of the disease as when I first commenced its study; and I should scarcely venture to tread upon ground which has been so often traversed and (remedially speaking) to so little purpose, by more accurate observers than myself, did I not feel that any observations however crude and scanty may perchance prove a link in the chain of evidence necessary to the successful elucidation of the symptoms and treatment of the affection.

On reviewing the whole *associated* symptoms we cannot avoid shewing the prevalent belief that beriberi consists in, or is mainly connected with, functional or structural diseases of the spinal cord and its meninges, and especially of the lowest division of the cord and few probably would venture to dispute Mr. Malcolmson's proposition "that the spinal cord is *primarily* disordered and that through the actions induced by the affections of its nerves the other organs suffer *secondarily*." The loss of power over the movements of the lower limbs; the tottering gait; the numbness and formication; and in some cases the total inability to move the limbs and the almost perfect anæsthesia, clearly point to impaired, perverted or obstructed function of the cord itself. While the spasmodic pains; the tonic spasms of the muscles; the burning pain at the soles of the feet; and in some cases the exquisite sensibility of the surface of the body generally equally denote affections of the *coverings* of the cord.

These symptoms are those which lend the disease its peculiar features and which are so apt to engross our attention to the exclusion of others equally interesting; and I conceive more important ones, viz., the anasarca; the diminished flow of urine; the characters of the urine

itself; and further the tendency sooner or later to disease of the heart, first evidenced by diffused and forcible action, next by bruit of different shades of harshness, pointing to valvular disease and lastly to rapid effusion into the pericardium; œdema of the lungs and sudden death by apnœa. These symptoms connected with the nervous, circulating and secreting systems, must be associated so as to be traced to one and the same cause. How then can we thus associate these evidences of a morbid condition of spinal cord, heart and kidneys, so as not only to make them all constitute one disease, but to trace the order in which they occur? It becomes an important question, and one upon which all our hopes of successful treatment hinges. Mr. Malcolmson, I have shewn looks upon the spinal affection as the *primary* disease, and the anasarca and heart affection as *secondary*. I am inclined to the opinion that the kidneys are *primarily* affected; and that the anasarca, spinal and cardiac affections are *secondary*, depending in fact upon the detention in the blood of the urea which the kidneys fail to eliminate from the system. Mr. Malcolmson appears to have examined the subject in all its bearings; and although he acknowledges that many points of resemblance exist between this disease and certain affections of the kidneys, first brought before the profession by Dr. Bright, and now known as Bright's kidney, yet he does not allow that the symptoms of Beriberi can be satisfactorily accounted for by assuming that the kidneys are primarily diseased.

But that they *are primarily* diseased, I entertain strong suspicion from having noticed that a febrile attack usually precedes the symptoms more peculiarly characteristic of the disease. The fever I allude to is of an intermittent type, and is attended with scanty and high coloured urine; the colour being *red* rather than brown. The patient appears to recover from this attack; but convalescence is slow and sooner or later complaint is made of numbness and swelling below the knees and the disease is proclaimed to be beriberi; the preceding febrile attack perhaps not

even remembered, or if remembered not considered to have any connection with existing symptoms; though if enquiry be made it will be elicited, that the urine has remained scanty and high coloured; that there has been constant thirst with a dry and harsh condition of the skin. I am satisfied that I have fallen into the error alluded to above, and have treated patients as for a slight intermittent fever when it has been symptomatic of a condition of active congestion if not inflammation of the kidneys. After my attention was awakened to the probability of disease of the kidney pertaining in beriberi, I examined the urine with a view to obtain evidence of such disease; and in two cases by the aid of the microscope indisputable evidence of structural disease was obtained; the urine being found to be loaded with altered blood discs, epithelial scales and coats of the tubuli uriniferi.

It may be said that an opinion cannot safely be supported upon the examination of two cases only; and such a remark would be just, but I wish it to be understood, that I am only directing attention to the fact that in *two* cases such evidences have been found; and under circumstances which I conceive will not admit of the inference that they were fortuitous, since the general characters of the urine in all cases of the disease which I have treated have agreed with those pertaining to the *two* cases adduced, and therefore that further microscopic examination of the urine *may* lead to the establishment of the fact of renal congestion or inflammation, and if so necessarily to considerable modification of treatment. It may not be uninteresting or out of place here to trace certain analogies which exist between the dropsical symptoms and secondary affections as met with in beriberi and those pertaining to renal disease, "Bright's Kidney." And first as regards the characters of the urine. The urine in beriberi is scanty and high coloured. "In almost every case" (writes Mr. Malcolmson and in this statement we must all agree) "I have seen or read a history of, the urine has "been scanty and of a deep red colour;" and I may add in

support of my proposition, that the kidneys are primarily disordered. Another passage from his work in which he seems to entertain doubts whether the morbid condition of the kidney upon which this scanty and high coloured urine depends does not *precede the spinal symptoms.* He writes, "I have not been able to ascertain positively whether the "change in the urine precedes or follows the symptoms of "disease in the cavity of the spine" but further on suggests "the probability that the kidneys suffer secondarily."

The characters of the urine in beriberi, I have found to agree with those remarked by Mr. Malcolmson.

In the earlier stages (when the kidneys only are affected and before the spinal cord suffers, or at any rate before its functions are much impaired) the urine is scanty; red coloured; sp. gr. 1·023, 1·025; reaction acid; deposits uric acid copiously on the addition of a drop of nitric acid; sometimes albuminous.

In the 2nd and more advanced stages (when the functions of the spinal cord have become much impaired, probably by dropsical effusion into the *theca*) the urine is still scanty and even as the case draws to a fatal termination totally suppressed, sp. gr. 1·013, 1·010; reaction highly alkaline; colour dirty smoky brown and sometimes albuminous; deposits the phosphates copiously.

In both cases it is deficient in urea.

Let us compare these conditions of the urine with those pertaining to renal disease. In the early stage of Bright's kidney, says Dr. Watson, "the urine is generally scanty; in-"stead of about 40 ounces, the patient voids 16-12-8 or "even as little as three or two ounces, it is red or dark; "its sp. gr. is somewhat but not as yet greatly reduced; it "contains an abundance of albumen." We have then much the same condition of the urine in the earlier stages of the two diseases; the only point of difference being in the quantity of albumen present, though this is not of much moment

since the presence of albumen is not necessary even to Bright's kidney, as Dr. Watson himself allows.

Again, in the advanced stage of Bright's kidney the urine is described to be "usually pale, slightly opaque and of *low* "sp. gr. 1·014, 1·010, 1·007; albumen too is present; but "more uncertainly than in the earlier periods and is defici-"ent in urea." Here also we have many points of resemblance. The peculiar character of the secretion is met with in beriberi, viz. its alkalinity, and copious deposition of phosphates does not, it is true, obtain in Bright's kidney, but that, we must refer to the spinal affection which is not associated with the "Bright's kidney." On the whole then, the characters of the urine are such as to warrant the opinion; that such pathological conditions of the kidneys exists in beriberi, as is found to be connected with the renal affection, termed "Bright's kidney." But with reference to the secondary affection met with in these two diseases there are also strong points of resemblance. In both we have anasarca; in both we find a tendency sooner or later to cardiac disease and cerebral affection. Nausea and vomiting are not unfrequent attendant upon both, in fact it is only in the spinal affection, and perhaps I may add in the more rapid fatal termination, that beriberi differs in its symptoms from Bright's kidney. But it is from the microscopic examination of the urine that we may expect to derive the most trustworthy evidence of structural disease of the kidneys (of Bright's kidney in fact) in beriberi for "so much more delicate is the microscopical "than the 'chemical' examination of the urine, we are told "that the groups of blood corpuscles may often be found "when heat and nitric acid fails to give any visible precipi-"tate."

I shall however no doubt be expected before concluding this subject; to account for the spinal symptoms in the disease under consideration; to point out (assuming that the renal disease is primary and the spinal secondary) how the latter can be dependent upon the former.

Dropsy we have seen is a necessary consequence of structural disease of the kidney; and occurs in every case of beriberi. Dropsy of the spinal canal we know also occurs in beriberi; and the pressure excited on the cord may be advanced as sufficient to account for the various lesions of motion and sensation; the extent of which lesion will of course be influenced by the amount of effusion. But it has also been advanced that in organic disease of the kidney; "there is a readiness of the various organs of the body to inflame especially of the serous membranes," and this tendency to inflammation of the serous membranes is attributable to the poisonous influence of the urea circulating in the blood, in consequence of the kidneys ceasing to eliminate it from the system, so that even if it be agreed that in those cases in which post mortem examinations of the bodies of beriberi patients have been made, evidences of spinal inflammation have been found, it does not follow that such inflammation was *primary*; since it may have been secondary; and produced in the manner above stated. In Europe, in kidney disease, this inflammation of the serous membranes is generally noticed in connection with the pleura, peritoneum and pericardium; and may it not be argued that in beriberi as met with in India, the spinal serous membranes, the endo and pericardium are more especially prone to inflame? We cannot, it is true, account for the preference shewn by certain diseases to attack certain structures; but we know nevertheless the fact. The preference shewn by acute rheumatism to attack the fibrous tissues, for example, and which Dr. Watson attributes to some "morbid or elective affinity between the inflamed tis-"sues and the poisonous material circulating in the blood." May not then I ask; the poisonous material circulating in the blood in beriberi by this same "elective affinity" excite inflammation of the investing membrane of the spinal cord, and may not the spinal and cardiac disease both in this way be accounted for? At any rate the subject is worthy of investigation and bears materially upon the treatment of the disease; for if this view of the relative order and association

of the symptoms can be sustained, it is clear that our treatment must be modified so as to meet the requirements of the affection especially as regards the congestion or sub-acute inflammation of the kidneys; which may exist, I may remark, without pain, weight or any sense of uneasiness in the loins. I am here unavoidably led on to review shortly the treatment *usually* adopted in beriberi and to enquire into the probable effect of that treatment, assuming that organic affection of the kidneys exists.

General depletion is not as far as I can learn much adopted except in the more acute forms of the disease, that is when it is marked by high febrile action; full and firm pulse and forcible action of the heart, under which circumstances providing it be instituted *early*, when alone it is admissible, it gives marked relief to all the symptoms. Local depletion is more especially directed to the spine with a view to remove supposed inflammatory action going on there; but in no case that I have read of, have leeches or cupping been resorted to in the lumbar region, directed especially to the relief of the kidneys. These measures, however, general and local depletion often not only give much relief, but materially increase the flow of urine, no doubt by diminishing the quantity of blood circulating in the kidneys. The preceding remarks, however, more especially, have relation to the administration of diuretics, which are called for by the diminished secretion of urine, and dropsical swellings, and which I am confident, are too indiscriminately administered, and without previous enquiry into the condition of the kidney. Now if congestion or sub-acute inflammation of those organs exists, it is clear that stimulant diuretics are likely to do more harm than good, and yet we have evidence that they are extensively and generally resorted to. The only diuretics admissible are I conceive those of an unirritating kind such as cream of tartar, acetate of potash, digitalis and abundance of plain cold water; aided by large frequently repeated hot poultices to the loins and the *hot air* bath. Amongst stimulant diuretics we

must rank the *treeak farook* since squills and turpentine enter into its composition. In regard to this medicine I am constrained to say that I do not entertain that high opinion of it which the profession at large does. In recent or acute cases when there is any febrile disturbance and any evening exacerbations, I have found it increase the feeling of internal heat; add to the dryness of skin and diminish the flow of urine; act as an irritant in fact to the already irritable kidneys. In chronic cases, when the paralytic symptoms are the most prominent it may act beneficially as a tonic and stimulant.

In accordance then with the pathological views of the disease, I have ventured to propound, I would inculcate the avoidance of all diuretics of a stimulant nature. I would attempt to restore the functions of the kidneys early, by local depletion, either by leeches or cupping, followed by dry cupping and frequently repeated large hot poultices to the loins. The functions of the skin should be carefully attended to, the patient clothed in flannel and the hot air bath used daily. The bowels should be acted on freely, by jalap and cream of tartar, and if diuretics be exhibited at all, they should be of the most unirritating kind, such as cream of tartar, or acetate of potash with tincture of digitalis largely diluted with water. In the more advanced stages of the disease, when there are symptoms of anæmia from an impoverished condition of the blood, iron and mineral tonics, (especially the tinctura ferri muriatis which possesses also diuretic properties) must be given, and (providing there are no evidences of any lingering structural diseases of the kidneys) wine and gin punch may be serviceable in supporting the system. Are blisters of any service? I am of opinion that they should be used with extreme caution, and never when we have reason to believe that the kidneys are congested or in a state of sub-acute inflammation. In one case I have had under treatment, the application of a blister produced strangury, total suppression of urine and death.

REMARKS UPON SUCH CASES AS HAVE BEEN PARTICULARLY WORTHY OF OBSERVATION, ETC.

The deaths as I have already shewn (exelusive of easualties from cholera in the left wing and upon whieh I am not expeeted to offer any remarks as they were not under my medieal eare) amount to 12; six of whieh were from beriberi; the general features of whieh disease as pertaining to the few eases I have had under treatment, have been already notieed. It remains for me therefore only to offer a few remarks upon the remaining six fatal eases.

CASE 1ST, Mahomed Esoph, Private.—Admitted on the 28th of June eomplaining of eough; with expeetoration and slight fever, had been ill five or six days, there was some dyspnœa with eonstant eough and expeetoration of glairy tenaeious mucus, the pulse was quiek and skin hot, no pain in ehest. Physieal exploration of the chest, revealed "extensive dulness on pereussion over the whole of left side of ehest," espeeially below the clavicle, where the respiratory murmur was entirely absent, and replaeed by bronehial respiration, bronchophony, and inereased voeal and tussal fremitus. Approaehing the mammary and in the lateral and axillary regions, small erepitation more or less obseured the respiratory murmur. The expiratory sound was prolonged. The ehest was blistered and tartar emetie exhibited whieh moderated the eough and expeetoration; and the report adds "that the "respiratory murmur returned in the lower peetoral (mam- "mary) region and that it was oeeasionally to be heard near "the clavieles, though the dulness on pereussion, broneho- "phony, with inereased voeal and tussal fremitus remain- "ed." No further improvement took plaee, and on the 11th phthisis was suspeeted in eonsequenee of a few dry elicks being heard beneath the elaviele; and eavernous respiration at the sternal end of elaviele, and from the supervention of evening exaeerbations of fever and trivial night sweats; expeetorants with demulcents and sedatives were now

administered and counter irritation kept up. On the 21st, evidences of the formation of cavities of some size were obtained. Whiffing and blowing sounds of different degrees of intensity were heard beneath the clavicle; and at the sternal end of 2d rib cavernous respiration and pectoriloquy, or harsh bronchophony. A splashing sound was thought to be also heard on coughing (indicating a large cavity in that region) and also a loud blowing sound during full inspiration. On the 25th additional evidence of phthisis was obtained by the sputa acquiring the nummular form, while the stethoscopic indications of a large cavity in the region before noticed became daily more clear. The ancles became œdematous and hectic well marked. At this stage the strength was supported and the night sweats controlled as far as possible. On the 6th of August he was discharged from the hospital on sick certificate to Vizagapatam at his earnest request; though this measure did not hold out any prospect of cure. On the 14th he returned to hospital (having since his discharge resided in the regimental lines instead of proceeding towards Vizagapatam) in a sinking state, with œdema of face and ancles and most exhausting sweats. The intercostal spaces over the seat of the diagnosed cavity had flattened and fallen in. Cavernous respiration and pectoriloquy were very distinct, and there were in addition dry friction sounds indicating extension of inflammatory action to the pleura from the approach of the cavity to the surface. He expired on the 16th. I was not able to procure an examination of the body.

Remarks.—This is a case of interest, being I opine one of those rare instances of acute phthisis, affecting nearly the whole of one lung, and rapidly running on to softening and elimination of the tubercular matter, with formation of cavities; many of which no doubt coalesced, constituting the large cavern, diagnosed beneath the sternal end of first rib.

Case 2d, Entered Pneumonia.—Admitted 22d October in a very weakly and debilitated state with a pulse at 144 small, and persistent heat of skin; makes no complaint of pain but

the respiration is hurried. This patient was discharged from hospital on the 7th of September after an attack of intermittent fever unattended with any symptoms of thoracic complication. After discharge he was placed on the convalescent report for a few days and then returned to his duty; from which it appears the Adjutant excused him as he was weak. This case was not reported to me nor did the patient attend at the hospital; but was brought in on the date and condition above stated. On stripping him for examination he was so weak that he could not sit up in bed; the chest was found to expand unequally and the left side to be motionless, dull on percussion, especially below the clavicle; full of dry crepitating rales and the respiratory murmur replaced by harsh bronchial respiration. Although weak, tartar emetic was given to reduce the inflammatory action going on, and a blister applied to the chest; the strength at the same time being supported by broths and nutritious diet. He had, I should mention, hectic and profuse sweats which led me to look upon the case as one of phthisis; the inflammatory affection of the lung being caused by the irritation of the tubercular deposit. He had not much cough, or a suppressed cough only, but a moist copious expectoration which was thrown off apparently without any effort.

The tartar emetic seemed at first to relieve the symptoms; but debility increasing it was discontinued, and sesquicarbonate of ammonia in ten grain doses with quarter grain of muriate of morphia exhibited in solution every 4th hour. No improvement followed. Moist crepitation (cavernous gurgling) replaced the dry crepitation; indication, the formation of numerous small cavities; the face became puffy and feet œdematous; the debility increased and he expired on the 10th November, having for some hours before his dissolution been too weak to remove the expectoration by coughing; the mucus filled the air passage and momentarily threatened death by asphyxia.

The following note is appended to this case in the journal. "This case has been one of phthisis, rapid deposit of miliary

" tubercle in both lungs, but more especially in the left, giv-
" ing rise in the first instance, to inflammation of the sur-
" rounding pulmonary tissue, indicated by the small dry cre-
" pitation." On the 4th cavernous gurgling attended by
" hectic and night sweats, indicated the formation of numer-
" ous small cavities by the softening and elimination of the
" tubercles."

The remaining fatal cases under the heads of dysentery, apoplexy, erysipelas and diabetes scarcely deserve comment. The latter (case of diabetes) furnished some points of interest; but which are noticed in every case, especially the influence of diet upon the amount of saccharine urine excreted; rice invariably augmenting the flow; which is to be accounted for by the facility with which starch is converted into sugar. Under a rice diet the quantity amounted to 14 pints and was reduced by a meat and unfermented bread diet to six pints. The specific gravity was not affected, it ranged throughout betwixt 1·033 and 1·040. Taking the average quantity of urine at ten pints and the specific gravity at 1·035, gives, by Dr. Bird's tables as the daily amount of solid matters excreted by the kidneys 7380·51 grains.

Thus—one pint of urine of specific gravity 1·035 contains grs. 81·55 of solid matters and one pint of the same urine will weigh grs. 9056, then $\frac{9056 \times 81\cdot55}{1000} = 738\cdot51$ grains and 738·51 by 10 the number of pints passed in 24 hours gives 7380·51 grains as the amount of solid matter passed in 24 hours.

J. L. RANKING, Assist. Surgeon,
Late in Medical Charge 8th Regt. N. I.

RAJAHMUNDRY,
1*st April*, 1851.

8TH REGIMENT N. I.

Return exhibiting the Strength of Hindoos and Mahomedans and Admissions and Deaths from each Class of Disease, Age not exceeding

Years of Age,		20		25		30		35		40		45		50		Above 50		Total.	
Strength,	Hindoos,	18		80		157		151		53		33		21		8		521	
	Mahomedans,	14		75		86		70		20		14		8		3		290	
Diseases and Classes of Diseases.		Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.
Fevers,	Hindoos,	11	..	12	..	29	...	34	...	6	..	7	...	5	..	....	..	104	..
	Mahomedans,	5	..	13	..	19	..	10	..	6	..	2	..	2	..	1	..	58	..
Cholera,	Hindoos,	..	...	..	..	....	..	5	2	1	1	..	...	..	..	....	..	6	3
	Mahomedans,	1	1	1	1	....	..	2	1	2	2	..	.	...	..	1	1	7	6
Dysentery Acute and Chronic,	Hindoos,	..	..	...	..	....	..	2	..	2	..	1	1	1	..	....	..	6	1
	Mahomedans,	..	..	..	..	....	..	2	..	...	..	..	...	..	..	....	..	2	..
Diarrhœa,	Hindoos,	..	..	..	..	1	..	1	..	..	..	1	..	1	..	....	.	4	..
	Mahomedans,	..	..	..	..	....	..	....	..	...	..	2	..	..	..	....	..	2	..
Other Diseases of the Stomach and Bowels,	Hindoos	..	..	..	..	...	..	2	1	..	..	..	...	..	..	....	..	2	1
	Mahomedans,	..	..	1	..	....	...	....	..	...	..	..	...	..	..	1	..	2	..
Hepatitis Acute and Chronic,	Hindoos,	..	..	..	..	1	..	....	..	..	..	..	...	..	..	....	..	1	..
	Mahomedans,	..	...	..	..	....	..	....	..	..	..	..	...	..	..	....	..	....	..
Diseases of the Lungs,	Hindoos,	1	...	..	..	....	..	3	..	1	..	..	..	..	..	....	..	5	..
	Mahomedans,	1	...	..	..	....	..	1	..	3	2	3	...	..	..	3	..	11	2
Do. Brain,	Hindoos,	..	..	..	..	1	..	2	1	3	..	..	...	..	..	....	..	6	1
	Mahomedans,	1	..	..	..	1	...	....	..	..	..	..	...	...	..	....	..	2	..
Rheumatic Affections,	Hindoos,	...	..	2	..	8	..	7	..	..	..	1	..	2	..	1	..	21	..
	Mahomedans,	...	..	2	..	6	..	3	..	3	..	1	...	1	..	1	..	17	..
Venereal do.	Hindoos,	..	..	2	..	....	..	1	.	..	...	..	..	..	..	...	..	3	..
	Mahomedans,	..	..	1	..	....	..	3	..	..	..	..	...	...	..	....	..	4	..
Dropsies,	Hindoos,	1	1	..	..	5	2	1	..	1	..	..	..	..	..	...	..	8	3
	Mahomedans,	...	..	..	..	3	1	1	1	..	..	..	...	..	..	....	..	4	2
All other Diseases,	Hindoos,	5	..	11	..	42	1	22	1	19	..	4	..	1	..	...	..	104	2
	Mahomedans,	5	...	39	...	21	..	29	..	14	..	2	...	3	..	1	..	114	..
Total..	Hindoos,	18	1	27	...	87	3	80	5	33	1	14	1	10	..	1	..	270	11
	Mahomedans,	13	1	57	1	50	1	51	2	28	4	10	..	6	..	8	1	223	10
	Grand Total...	31	2	84	1	137	4	131	7	61	5	24	1	16	..	9	1	493	21

EAST INDIANS.

Strength 19.

Years of Age,	30		45		Total.	
Diseases and Classes of Diseases.	Ad.	Died.	Ad.	Died.	Ad.	Died.
Fevers,	1	..	..	..	1	..
Diseases of the Lungs,	..	..	1	..	1	..
All other Diseases,	1	..	..	..	1	..
Total...	2	..	1	..	3	..

SAMULCOTTAH, 1st *April*, 1851.

8TH REGIMENT N. I.

Return exhibiting the Strength of Hindoos and Mahomedans and Admissions and Deaths from each Class of Disease according to length of Service.

Years of Service,		under 1		1 to 2		2 to 3		3 to 4		4 to 5		5 to 6		6 to 7		7 to 10		10 to 15		15 to 20		20 to 25		25 to 30		Above 30		Total.	
Strength,	Hindoos,	25		20		27		16		19		17		32		130		161		42		19		6		7		521	
	Mahomedans,	14		6		9		10		8		17		13		73		82		36		10		9		3		290	
Diseases and Classes of Diseases.		Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.	Admd.	Died.
Fevers,	Hindoos,	9	...	1	...	1	...	3	..	3	..	3	...	...	...	23	..	37	..	12	..	2	...	8	..	2	..	104	..
	Mahomedans,	4	...	2	...	...	...	..	..	2	..	9	...	4	...	16	...	11	..	6	..	...	..	2	..	2	..	58	..
Cholera,	Hindoos,	...	...	...	...	...	...	..	...	...	..	...	...	...	...	1	..	3	2	2	1	...	..	...	..	...	..	6	3
	Mahomedans,	1	1	...	...	...	...	..	..	1	1	...	...	...	...	...	..	2	2	...	..	2	1	...	..	1	1	7	6
Dysentery Acute and Chronic,	Hindoos,	...	...	...	...	...	...	..	..	...	..	...	...	..	...	...	..	3	..	1	..	1	1	...	...	1	..	6	1
	Mahomedans,	...	...	...	...	...	...	..	..	...	..	...	...	..	...	...	..	1	..	1	..	...	..	...	...	...	..	2	..
Diarrhœa,	Hindoos,	...	...	...	...	...	...	..	..	...	..	...	...	..	...	...	..	2	..	1	..	...	..	1	..	...	..	4	..
	Mahomedans,	...	...	...	...	...	...	..	..	...	..	...	...	..	...	...	..	...	..	...	..	1	..	1	..	...	..	2	..
Other Diseases of the Stomach and Bowels,	Hindoos,	...	...	...	...	...	...	..	..	...	..	...	...	..	...	...	.	2	1	...	..	...	..	...	..	...	..	2	1
	Mahomedans,	...	...	...	...	...	...	..	..	...	..	...	...	1	...	...	..	...	..	...	..	...	..	...	..	1	..	2	.
Hepatitis Acute and Chronic,	Hindoos,	...	...	...	...	...	...	..	..	...	..	...	.	1	...	...	..	...	..	...	..	...	..	...	..	...	..	1	..
	Mahomedans,	...	...	...	...	...	...	..	..	...	..	...	...	...	...	...	...	...	..	...	..	...	..	...	..	...	..	...	..
Diseases of the Lungs,	Hindoos,	1	...	...	...	...	...	..	..	...	..	...	..	..	...	...	...	3	..	1	..	...	..	...	..	...	..	5	..
	Mahomedans,	...	...	1	1	...	...	..	..	...	..	...	..	..	..	1	..	2	..	...	..	5	1	...	..	2	..	11	2
Do. Brain,	Hindoos,	...	...	...	...	...	...	.	..	...	..	...	...	..	..	1	..	2	1	3	..	...	..	...	..	...	..	6	1
	Mahomedans,	...	...	1	...	...	...	..	..	...	..	...	..	..	..	...	..	1	..	...	..	...	..	...	..	...	..	2	..
Rheumatic Affections,	Hindoos,	...	...	...	...	...	...	..	.	...	..	2	..	1	..	5	..	7	...	3	..	1	..	2	..	...	..	21	..
	Mahomedans,	...	...	...	...	...	...	..	..	...	..	...	..	3	..	2	..	6	..	4	..	1	..	...	..	1	..	17	..
Venereal, do.	Hindoos,	...	...	...	...	...	...	..	..	...	..	1	..	...	..	1	..	1	..	...	..	...	..	...	...	...	..	3	..
	Mahomedans,	...	...	...	...	...	...	.	..	...	...	...	...	...	..	1	..	2	..	1	..	...	..	...	..	...	..	4	..
Dropsies,	Hindoos,	1	1	...	...	...	...	..	..	..	..	...	...	..	..	3	2	3	..	1	..	...	..	...	..	...	...	8	3
	Mahomedans,	...	...	...	...	...	...	..	..	..	..	...	..	..	..	1	1	2	1	...	..	1	..	...	..	...	..	4	2
All other Diseases,	Hindoos,	5	...	...	...	1	...	..	..	1	..	1	...	4	..	18	..	56	1	12	1	2	..	3	..	1	..	104	2
	Mahomedans,	3	...	4	...	...	...	1	..	4	..	5	..	11	..	31	..	30	..	11	..	5	..	5	...	4	..	114	..
Total...	Hindoos,	16	1	1	...	2	...	3	...	4	..	7	..	6	..	52	2	119	5	36	2	6	1	14	...	4	..	270	11
	Mahomedans,	8	1	8	1	...	...	1	...	7	1	14	..	19	..	52	1	57	3	25	0	15	2	8	...	11	1	223	10
Grand Total...		24	2	9	1	2	...	4	...	11	1	21	..	25	..	104	3	176	8	59	2	21	3	22	..	15	1	493	21

EAST INDIANS.

Strength 19.

Years of Service,	15 to 20		25 to 30		Total.	
Diseases and Classes of Diseases.	Ad.	Died.	Ad.	Died.	Ad.	Died.
Fevers,	1	..	..	..	1	..
Diseases of the Lungs,	..	..	1	..	1	..
All other diseases,	1	..	..	..	1	..
Total..	2	..	1	..	3	..

Samulcottah, 1st April, 1851.

The preceding observations on the subject of Beriberi were perused with great interest by the Medical Board, and they requested Assistant Surgeon Ranking to continue the investigation and prosecute the inquiry into the nature of this still obscure and fatal disease; the following valuable production has been the result:—

REPORT ON BERIBERI BY ASSIST. SURGEON J. L. RANKING.

In my annual report for the 8th regiment N. I. for the year 1850, in connection with Beriberi (to which disease I shewed that one half of the fatal cases for the period included in that report were to be attributed) I ventured to dispute Mr. Malcomson's proposition in his essay on the disease "That the spinal cord is primarily disordered and that through actions induced by the affections of its nerves the other organs suffer secondarily" and to advance in its stead that "the kidneys are primarily affected, and that the anasarca spinal and cardiac affections are secondary depending upon the detension in the blood of the urea which the kidneys fail to eliminate from the system;" In point of fact, I traced an analogy between Beriberi and Bright's disease of the kidney.

This resemblance was forced upon me by the discovery in two cases of all the elements of Bright's kidney in the urine, viz., albumen, fibrinous casts of the tubuli uriniferi, with abundance of epithelial cells, blood discs, &c., and further by the similarity of the symptoms, both essential and secondary pertaining to the two diseases.

I admitted that I put forward my views with much diffidence since I felt that the above-mentioned evidence of structural renal disease might have been accidental; though a strong impression remained that as opportunities offered, I should be enabled to accumulate, by a series of careful observations, facts which would fully bear out and substantiate the opinion advanced. These opportunities I regret to say have been but few. Four cases only have since fallen under my observation, but in those indisputable evidence of structural renal affection has been obtained both by the chemical and microscopical examination of the urine; and in one case

by the chemical analysis of the blood and subsequent post-mortem examination of the kidneys.

Before proceeding to the consideration of the points of analogy between beriberi and Bright's disease, I purpose giving short and condensed histories of the cases alluded to, that is, those cases in which satisfactory chemical and microscopic examinations of the urine were made. Other cases have fallen under my observation to which I shall allude in a tabular form hereafter in support of the analogy which I have assumed to exist between the secondary symptoms (and I may add the terminations,) in the two diseases. In these cases although some attention was paid to the condition of the urinary secretion, even to testing for the presence of albumen; yet I feel that partly from want of manipulative skill and partly from the absence of the necessary appliances the examinations then made are deficient in value. In some cases for instance in which no record is made of the presence of albumen, it is probable that its non-detection was owing to want of tact in searching for it. I was not then aware of the difficulties in the way of determining the presence of albumen in alkaline urine, that alkaline urine containing albumen is not in fact coagulable by heat, or that even heat and nitric acid combined, though sure tests for that principle of the blood, require certain precautions in their application.

With regard however to the cases which I am about to detail, I can without hesitation pronounce them to be in every respect trustworthy, the utmost care having been taken both with the chemical and microscopical examinations.

The treatment is scarcely alluded to the object being principally to establish the point of organic renal disease.

Abstracts of Cases.

Case 1st, Mahomed Hoosman, 8th Regiment N. I.—Admitted 4th July 1850, with œdema of the legs, feverish excitement increased towards evening, hurried respiration

but with no evidence of cardiac or pulmonary affection, ill four days. Took a purge of jalap and cream of tartar; and cream of tartar drink as a diuretic. On the 5th there was nausea and vomiting with hurried respiration, increasing anasarca affecting the trunk of the body, vertigo and a pulse at 96 and soft, he was ordered the compound squill pill and continued the cream of tartar as a diuretic as the urine was reported scanty and high coloured; at 4½ P. M. of the same day it was reported "no urine since morning," during the evening he passed nine ounces of a deep red colour, acid and strongly albuminous, there was no pain in the back or loins, the anasarca had increased; 12 leeches were applied to the loins and he was purged freely. 6th. Much general anasarca, 22 ozs. urine, tumultuous action of heart; but no alteration of its sounds.

Leeches to heart, continued the purgatives with diuretics, examination of urine, reaction acid, sp. gr. 1·014; microscope shewed fibrinous casts of the tubuli uriniferi, with blood discs, abundance of epithelium and a few crystals of oxalate of lime; calomel with squills, liq. ammon. acet. with small doses of tartar emetic as a diaphoretic, urine more scanty, high coloured and turbid, loaded with blood discs and casts of the tubuli uriniferi. The treatment was now mainly directed to relieve the kidneys through the bowels and skin, 12 o'clock not so well, no urine, two P. M. urgent dyspnœa and signs of pericardial effusion. From this time the dyspnœa increased and he died asphyxiated at three P. M. No examination of body permitted.

Case 2nd, Venkataswamy, 8th Regiment.—Admitted 31st August 1850, with œdema, weakness and numbness of the legs as high as the knees, a constant nausea but no vomiting, no pain in back or loins, skin hot and dry, thirst, loaded tongue with red edges, pulse 128, firm and large. Bowels constipated, had fever four or five days out of hospital, and the œdema preceded the numbness, urine said to be scanty, a specimen passed in my presence examined; results, reac-

tion acid, turbid from a mucus cloud and albuminous; was bled to 20 ozs. which reduced and softened the pulse and relieved the numbness in the legs, no pain whatever in the spine or region of kidneys. September 2nd, œdema less, skin softer, numbness less, urine still scanty, high coloured and albuminous. 3rd, Pain in the right side complained of, evident enlargement with tenderness of the liver, urine 4 ozs. in 24 hours, deep brown colour; leeches to liver; squills, digitalis and cream of tartar, purgatives, hot hair bath. 4th, No improvement. A microscopic examination of the urine (3 ozs. in the 24 hours), gave distinct casts of tubuli uriniferi with blood discs and abundance of epithelium with organic globules. 5th, 6 ozs. of urine which is albuminous, general condition of patient not improved, pain in side continues but there is less tenderness. 6th, Liver still tender, urine scanty, and albuminous; blister to the liver, continue remedies, treak farook 10 grs. bis dic. 7th, Less urine only 3 ozs. with increasing anasarca, slight dyspnœa, skin hot and harsh, pulse 100 weak; pergat, treak. ol. terebinth ½ dr. ter die.

Vespere, total suppression of urine, anasarca increasing, urgent dyspnœa; omit ol. terebinth, large hot poultices to loins, hot air bath, blister to chest, æther and camphor with laudanum.

8th.—3 P. M., expired rather suddenly.

No examination of body allowed.

CASE 3, Shaik Adam, Private 8th Regiment N. I.—Was admitted into the station hospital at Rajahmundry on the 18th October 1851, with numbness and slight œdema of lower extremities, pulse 105, full and resisting, skin hot and dry, tongue furred with red tip and edges, bowels costive; urine said to be free but high coloured, v. s. to syncope. A purge of calomel and jalap, antim. tart 2 grs. potassa bitart. 2 drs. aquæ 1 pint during the day as a diaphoretic and diuretic. The patient stated that he had never had the disease before, and that the œdema preceded the numbness. 19th, Fainted on the loss of only 10 ozs. of blood which was highly buffed and cupped (on analysis 200 grs. yielded on

evaporation to dryness over a closed steam bath, solids 49 grs., water 151 grs.; the serum had a sp. gr. of 1·030, and treated according to the process of Dr. O'Rees, the liquid last obtained yielded with nitric acid after considerable reduction by evaporation, crystals resembling those of nitrate of urea and behaving like that compound before the blow pipe. The crystals were however most probably some of the salts of the serum; since the high sp. gr. of the serum, and the early stage of the disease at which the blood was drawn would militate against ureal impregnation); numbness less, skin hot, pulse 106 softer, hearts action strong, sounds natural, urine of 24 hours 8 ozs; colour deep brown, muddy with copious deposit of crystalline phosphates, mixed with urate of ammonia, sp. gr. 1·034; alkaline, ammoniacal and slightly albuminous. 22d, Numbness very slight, no œdema, urine (24 hours) 24 ozs; deposits less, pulse 106. Continued improving till the 28th, the pulse however remaining high, urine averaging 30 ozs. and less alkaline. On the 30th the pulse was 88, the urine 28 ozs, and free from deposit and the patient expressed himself as feeling well and medicines were omitted. On the 3d of November it is reported in the hospital journal "makes no complaint but looks ill." Pulse 80, tongue clean, bowels in good order, appetite bad, urine 20 ozs., pale muddy; but without deposit, alkaline, sp. gr. 1·025 and albuminous, the microscope merely revealed crystals of the tripple phosphates mixed with urate of ammonia and blood discs. He was ordered muriated tincture of iron, with dilute muriatic acid. 5th, Face puffy, œdema of feet and legs, countenance leucophlegmatic, pulse 80, urine 24 ounces turbid dirty coloured, depositing, sp. gr. 1·032 and albuminous; microscope exhibited blood discs, degenerated epithelial cells, with a few casts of the tubuli uriniferi and the deposits before noted. 6th, Bowels freely moved by jalap, œdema the same, pulse 88, skin hot, and has more decided febrile heat towards evening, urine 24 ounces, depositing more copiously. A specimen passed in my presence had an acid re-action, was turbid but soon deposited a fleecy sediment and in 20 hours became alkaline and deposited phosphates,

the fleecy sediment above noticed yielded under the microscope epithelial cells in all stages of cell growth, many fatty; blood discs, casts of the tubuli uriniferi with independent oil globules. He had now 12 leeches to loins, with cream of tartar and digitalis as a diuretic, warm baths and Dover's powder at nights. 8th, Pulse 100 smaller, legs still œdematous, disturbed frequently at night to urinate, leucophlegmasia increasing, cheeks and eyelids puffy, no numbness complained of, suspected of not telling all his ailments; wishes to be sent away on sick certificate, urine albuminous of sp. gr. 1·015 and containing all the microscopic elements of the inflammatory form of Bright's disease. Repeat leeches to loins, continue medicines. 10th, Pulse 120, hearts action tumultuous but sounds healthy, persistent heat and dryness of skin; emplast; belladonnæ to region of heart, continue medicines; continued in the same state till the 13th, when the urine had increased to 32 ozs. in the 24 hours, acid when first passed, albuminous, and under the microscope was found to be loaded with casts of the tubuli uriniferi and other microscopic elements of kidney disease. On the 14th at 10 P. M. dyspnœa set in with restlessness and abdominal pain, a large blister was applied; but the restlessness and dyspnœa increased, and he expired (somewhat suddenly having been in conversation with the dresser five minutes before) at midnight; no examination of the body could be obtained.

The marginal drawing represents the microscopical appearances in this case and is from drawings made at the time of examination.

a Casts of tubuli uriniferi, containing abortion cells and blood discs.

b Blood discs.

c Epithelial cells in different stages of growth.

D Independent oil globules.

e Fatty epithelial cells.

Case 4th, Venkatasemoodoo, Convicted prisoner was admitted into the jail hospital at Rajahmundry on transfer from Masulipatam on the 23d November 1851.

The case forwarded with him stated that he had suffered from rheumatism and epilepsy. The patient's statement was to the effect that he had had pains and just before leaving Masulipatam his body began to swell, "that this was attended with scanty urine, that the swelling had increased on the journey and the urine become almost suppressed ; indeed he affirmed that he had actually passed *no* urine for 10 days." His condition on admission was as follows, general anasarca more especially of the upper part of the body with ascites; face puffed and leuco-phlegmatic. Bowels constipated for days, urine very scanty, pulse 106 regular and soft, skin hot and dry, thirst, tongue furred with red-edges, tenderness over the region of the liver. He was ordered compound powder of jalap each morning, tinct. of digitalis in minims 20 doses with cream of tartar largely diluted three times a day as a diuretic, with compound ipecac powder at night. On the 26th he remained in the same condition there being no reduction of the dropsical swelling, urine only three ozs. in 24 hours. The examination of the urine gave the following results, colour deep yellowish brown, muddy, sp. gr. 1·020 reaction faintly alkaline; with nitric acid and heat a dense deposit of albumen occupying quarter of the test tube. The microscope revealed blood discs, mucus and organic globules urate of ammonia with prisms of tripple phosphates. He was now ordered 20 leeches to the lumbar region to be followed by large hot poultices, all diuretics, but plain cold water were omitted, the Dover's powder was continued at night, and two grains of calomel given every 4th hour. 27th, No improvement, urine four ozs. mouth tender though he has only taken six grains of mercury, pulse 96, skin less hot; omit mercury, repeat cream of tartar with tinct. digitalis, hot fomentations to loins. 29th November, urine yesterday four ozs. since yesterday morning none, unless some has been passed in bed, a urinary odour from the person, v. s. to approaching faintness. A large blister to loins of the *emplast mylabris.*

On the 30th, he was somewhat better, he lost only four ozs. of blood when he turned sick and faint, urine increased to six ozs. pulse 100 small, skin cooler and softer, no diminution of the dropsy.

Examination of the blood.

Highly buffed and cupped, sp. gr. of serum 1·023; treated according to Dr. O'Rees process, yielded distinct crystals of nitrate of urea.

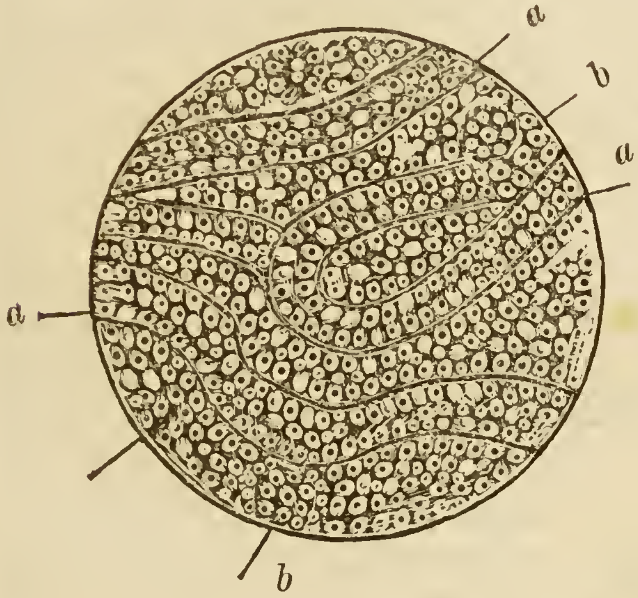
Examination of urine; six ozs. in 24 hours, deep smocky brown, reaction neutral, deposited copiously, was highly albuminous, the microscope revealed very distinct and abundant casts of tubuli uriniferi with cell growths in all stages of development, mucus and organic globules with crystals of the tripple phosphates and urate of ammonia as it occurs in neutral or alkaline urine. The remedies were continued and the hot air bath ordered every night. December 2nd, no appreciable change in the dropsical symptoms, urine from five to six ounces. 3rd, Anasarca slightly diminished, urine increased to 16 ozs., no perspiration induced by the hot air bath, pulse 100 small. Began to eomplain this day of loss of power over and partial loss of sensation in the feet and hands, no "numbness" but evident impaired sensibility, urine turbid, amber yellow, sp. gr. 1·020, highly albuminous, under the microscope each drop yielded abundant casts of the tubuli uriniferi with the other elements of Bright's disease, and the urate of ammonia had given place to oxalate of lime which was mixed with prisms of the tripple phosphate. From this period the patient fell off, the anasarca and ascites increased and at one time the scrotum and penis required relief by acupuncturation. The urine became more and more scanty; but always presented the same general characters, viz., was more or less deep coloured and smocky; acid when first passed and depositing on standing a fleecy sediment which consisted of the microscopic elements above noticed and albuminous, the quantity of albumen however decreasing as the case approached a fatal termination. There was distinct paralysis, the patient towards the close being unable to move hand

or foot without assistance, which condition remained in the lower extremities even after the anasarca had entirely deserted them for the upper parts of the body. On the 13th he began to complain of dyspnœa which speedily became urgent in spite of the application of a larger blister and the exhibition of chloroform and æther internally. He expired at 10 P. M. of this date. The urine was carefully examined nine times during the progress of the case and invariably presented the characters noted above.

The microscopical appearances copied from drawings made at the time are represented in the margin.

The body was examined nine hours after death, the abdomen only being opened, the examination being hurried in consequence of its being the first instituted in the jail for many years. On opening the abdomen about two pints of clear serum escaped. The peritoneum was pale, as also were the intestines which were free, the liver was enlarged and congested, spleen natural, the *kidneys* were removed and subjected to careful examination at my own house. The left kidney was enlarged and lobulated and weighed four ozs. and three drams. The right kidney weighed three ozs. and 1½ drams, both were mottled and marbled from congestion of the superficial vessels, the investing membrane was readily removed and on making a longitudinal section each kidney was found highly congested; but the left most so, the blood flowing freely. In each the cortical substance was increased, but most so in the left, in which it encroached upon and appeared to compress the medullary. In both the malphygian bodies were turgid, and in both the fluid scraped from the incised surfaces yielded under the microscope casts of the tubuli uriniferi full of altered and unaltered blood discs and epithe-

lial cells in all stages of cell growth, mixed with independent epithelium and blood discs, and granular matter.



The marginal figure imperfectly represents these appearances.

a Casts of tubes full of blood dises and abortions of cell growth.

b Cross sections of the same.

c Independent epithelial cells.

d Independent bloods discs mixed with granular matter.

Case 5th, Moonsiff of Peddapoor placed himself under my care on the 19th of November 1851. His history was as follows: suffered three months ago from fever, this was followed by numbness first of the legs then gradually of the whole body, and upon this supervened cough with eopious expectoration; his eondition on admission under treatment was as follows, greatly emaeiated, very weak, pulse 140 small irritable but regular; skin dry, hot and harsh, œdema of feet and hands, numbness of the whole body and especially of the integument of the abdomen, constant cough with copious muco-purulent expectoration; a sense of weight and tightness at epigastrium much complained of, urine seanty and of a deep red eolour; 10 ozs. in 24 hours, turbid, depositing copiously; sp. gr. 1·020, and distinctly albuminous; the microscope shewed epithelium in great abundance, casts of tubuli uriniferi and blood discs; the chest affection was bronchitis. He was treated with a eombination of diuretics, diaphoretics and expectorants; he was too weak to admit even of local depletion, and obstinately refused a blister, the œdema was removed, the cough allayed, and other signs of improvement exhibited themselves; but he again fell off, got

dissatisfied with the progress of his case and returned to the native practitioners, his greatest complaint was of the numbness, the œdema being only trifling; the urine was examined eleven times and presented the following charaeters generally; colour deep (shades of amber and red) sp. gr. within the healthy standard, that is ranging between 1·018 and 1·025, reduced in quantity, often only 8 or 10 ounces in 24 hours, and never exceeding 16; acid when first passed but speedily becoming alkaline on standing, depositing first a fleecy sediment and afterwards urates and phosphates mixed with occasionally a few crystals of oxalate of lime, albuminous and under the microscope yielding casts of tubuli uriniferi, epithelium in all stages of cell growth, blood discs, and oil globules, as exhibited in the annexed drawing.

In connection with this case I may mention that a form of urate of ammonia new to me and not deseribed in any work I have consulted occurred. It consisted of large opaque spherical masses forming both a pellicle, and a deposit. It was proved to be urate of ammonia by its slow solubility in acids and with the formation of crystals of uric acid; I have since seen a notice of the same deposit, by Dr. Bennett of Edinburgh, and I have since observed it in other cases. It is imperfectly represented in the marginal drawing.

It will be seen that it differs materially from the ordinary forms of urate of ammonia, as occurring in acid or alkaline urine. It mostly resembles the latter form but differs from it in not being furnished with processes and in oceurring as a pellicle as well as a deposit.

Case 6th, Coovah admitted into Jail Hospital at Rajahmundry on the 9th November 1851, with symptoms of quotidian fever, on the 12th he complained of some numbness of the lower extremities and the urine was seanty. He had leeches to loins and cream of tartar with digitalis and Dover's powder at night. He improved, the urine increased and the numbness subsided, at this period an examination was made of the urine, and it was found to be albuminous. On the 16th he complained again of feverish symptoms, the urine was again scanty and the numbness returned, there was also a swollen puffy condition of the face and eye-lids and there was tenderness in the left lumbar region. The urine was again examined and found to be "deep muddy brown, turbid, alkaline (had stood some hours) of sp. gr. 1·016 and albuminous" quantity 6 ozs. in 24 hours; the microscope revealed "epithelial cell growths in abundance, mucus-blood discs and phosphatic deposits, and a few fragmentary casts of the tubuli uriniferi;" he had 20 leeches to loins and a combination of Dover's powder. Liq. ammon. acet., tinct. of digitalis and bitart of potash with the hot air bath at night; on the 17th he was still feverish, had pain in the left lumbar region and had passed only 6 ozs. of urine. The numbness had subsided, a blister of emplast mylabris was ordered and the combination of diuretics and diaphoretics continued; on the 18th as there was not much improvement leeches were again applied, the urine which was 8 ozs. in 24 hours, had a sp. gr. of 1·018 was smoky, albuminous, and let fall a fleecy sediment made up of tube casts and epithelial cells with a few crystals of triple phosphates and oxalate of lime. On the 20th there was no improvement and bronchitis had set in, for which it was requisite to give him tartar emetic; the pulse was 120 and easily obliterated, the urine (examined on the 19th) was 4 ozs. in 24 hours smoky, sp. gr. 1·013 and highly albuminous, and under the microscope casts were still found and the epithelial cells were principally fatty. On the 20th the tube casts were few and mostly empty and the urine only *slightly* albuminous. On the 21st he was better, the cough

had subsided materially, the urine had increased to 14 ozs. and was acid on standing. The epithelial cells were much less abundant, the casts only fragmentary and the deposit consisted of urate of ammonia. On the 22d the urine was 32 ozs. sp. gr. 1·015, contained no tube casts and ceased to yield albumen to heat and nitric acid, the cough had nearly left; he was ordered a cough mixture occasionally and continued Dover's powder and hot air bath. On the 25th the urine was 22 ozs. and had a sp. gr. of 1·020. On the 27th he shewed signs of evident improvement, the urine was 20 ozs. of sp. gr. 1·018, and the microscope revealed only epithelium. On the 29th (the last report made in the case) it is noticed in the journal "appears certainly better, skin much softer though he does not perspire," pulse 88, cough scarcely noticed, urine 16 ounces of sp. gr. 1·015 not albuminous.

Having recorded briefly the leading features of those cases of beriberi accompanied with undoubted evidence of renal alteration which have fallen under my observation; I proceed to the consideration of those points in which the disease resembles Bright's kidney, and first select the most striking and prominent, viz., the physical, chemical and microscopical characters of the urine, the chemical constitution of the blood and the pathological conditions of the kidneys.

In the cases detailed the urine has been attended to in all its relations; in two, analysis was made of the serum of the blood; and in one the kidneys were examined after death.

Before, however, proceeding to the consideration of those points, it will be well to have clearly before us the character of the urine, blood and kidneys in Bright's disease.

With regard to the urine Dr. Christison writes "it is at times bloody, often turbid even when first passed, more or less coagulable by heat and nitric acid and generally shews after some hours rest a fleecy sediment in which the microscope recognises blood corpuscules, degenerated epithelial

cells from the mucus membrane of the uriniferous tubes, and fibrinous casts of these tubes. In this form (the primary and acute) the density is not low until the disease has subsisted for some time, on the contrary it is at first, although by no means always, of natural density and on one occasion I found it to be as high as 1·027 and on another 1·046, although there was no sugar but an enormous amount of albumen." In the chronic form the same author writes, "the urine will be found to be pale in colour, low in density, more or less coagulable by heat and nitric acid, turbid when passed owing to a fleecy matter which remains very long suspended and does not entirely settle, but forms a sediment presenting various combinations of blood globules, pus globules, oil globules, degenerated epithelial cells and fibrinous tube casts sometimes also with the ordinary deposits of healthy urine."

It is more especially to the inflammatory form of the affection that the remarks I have to offer apply, for though I have occasionally detected independent oil globules and fatty epithelial cells I have not recognised them in the abundance described as pertaining to stearosis or fatty degeneration.

Keeping the above description by Dr. Christison in view (which is portion of a clinical lecture by that professor in the Monthly Journal of Medical Science for the month of June 1851, and may consequently be supposed to be a correct resumè of existing knowledge of the disease) it remains for me to examine the condition of the renal excretion in the cases of beriberi which have been detailed. The excretion then it will be seen is reported to have been high coloured (that is of a red or reddish brown hue except when it has been especially noted as "smoky") turbid when first passed and slowly depositing a fleecy sediment; faintly acid; but often speedily becoming alkaline especially in the more advanced stages of the disease; of moderate sp. gr. relatively; but taking into consideration the small quantity of water excreted,

really low; always more or less albuminous and under the microscope presenting blood discs, casts of the tubuli uriniferi, epithelial cells in all stages of cell growth, organic globules, &c.

The annexed table exhibits the result of observations upon the density of the urine in five cases in which it was examined, together with the quantity excreted in 24 hours, and amount of solids; 713 grains are assumed to be (according to Dr. Christison's formula) the amount of the solids excreted by the kidney of a healthy individual (European) in 24 hours. This may probably be too high a standard for the native; but the table will still shew a most deficient elimination from the blood of the solid constituents of the excretion, except in one case in which it is to be observed that no experiments were instituted to ascertain whether the high sp. gr. was due to "an enormous amount of albumen" as in Dr. Christison's cases.

NAMES.	Urine in 24 Hours.	Sp. Gr.	Solids excreted in 24 Hours in Grains.	Deficiency in Grains.	REMARKS.
	ozs.				
Ramaswamy, - -	24	1010	244·80	468·80	
	24	1010	244·80	468·20	
	26	1010	265·28	447·72	
	32	1012	391·68	321·32	
	30	1013	397·80	315·20	
	35	1015	535·50	177·50	
Shaik Audam, - -	8	1034	277·44	435·56	
	24	1032	783·36	70·36	In excess.
	20	1025	510·00	203·	
	24	1032	783·36	70·36	In excess.
	25	1030	765·00	52·	In excess.
	28	1015	428·40	284·60	
Moonsiff's Case, - -	10	1022	204·	509·	This table is compiled in accordance with formula given by Markwick in his work on the urine and must, of course, be considered as approximative only to the truth.
	12	1020	244·80	468·20	
	30	1010	306·	407·	
	30	1020	602·	111·	
	10	1022	224·40	488·60	
	10	1022	224·40	488·60	
	24	1020	489·60	223·40	
	12	1025	306·	407·	
	12	1022	269·28	443·72	
Venkatasemoodoo, -	6	1022	124·64	588·36	
	6	1022	124·64	588·36	
	6	1025	153·	560·	
	16	1020	326·	397·	
	8	1021	195·64	517·36	
	9	1022	201·96	511·04	
	18	1023	422·28	290·72	
	4	1020	81·60	631·40	
	12	1022	269·20	443·72	
Coovah, - - -	12	1038	465·12	247·88	
	3	1025	76·50	636·50	
	6	1016	79·80	633·20	
	8	1018	146·88	566·12	
	4	1013	53·04	659·96	
	14	1012	171·36	541·64	
	32	1015	409·60	223·40	
	22	1020	448·80	264·20	
	20	1018	367·20	345·80	
	16	1015	244·80	468·20	

Taking the quantities secreted in the 24 hours together with sp. gr. as exhibited in this table, the remark before made and with the exception above noticed is completely verified; viz., that although each specimen may have yielded on examination the density of health, and in some few have exceeded the healthy standard, yet if we consider the *density* in connection with *quantity*, the former is really low and exhibits a most defi-

cient excretion of matters, which, by detention in the system, tend rapidly to the degeneration of the blood and the lighting up of those secondary inflammatory affections of the serous membranes common both to the disease under consideration and to Bright's kidney; continuing our investigations into the condition of the urine in the cases recorded, in addition to the characters already remarked upon, we find under the microscope blood discs, casts of the tubuli uriniferi, epithelial cells in all stages of growth, and by chemical tests albumen; rendering (I think it must be allowed) the resemblance as regards this part of the evidence complete. But I have *yet* a few words to add regarding the urine. I have said that I have in all cases found it to be *acid* when recently passed (in the earlier stages of the disease the acidity indeed is greater than natural, this reaction remaining for many hours, crystals of lithic acid depositing spontaneously upon the sides of the test tube, and being easily precipitated by the addition of a stronger acid, as a drop of muriatic acid); but this acid condition according to my limited experience also pertains in the more advanced stages of the disease (that is when the urine *on standing* lets fall a copious deposit of the mixed phosphates acquiring a strong alkaline and even ammoniacal reaction) provided it be examined *immediately it is passed.* I mention this circumstance because I conceive that it is of considerable importance to examine the excretion before this acid reaction passes off; that is before by the decomposition of the urea, sufficient free ammonia has been generated to liberate the phosphates and to impart an alkaline reaction to the fluid. If this be done it will be found to let fall in an hour or two a fleecy sediment in which (if they exist) the microscopic elements so often enumerated will be found. It has occurred to me to find tube casts, &c. in abundance in an *acid* specimen of urine which was not to be detected in a second specimen from the same patient which had acquired an alkaline reaction on standing. The tube casts we know are composed of fibrine and are most delicate; fibrine is soluble in the

caustic alkalies, and it is therefore probable that these delicate filmy casts are dissolved by the free ammonia generated by the decomposition of the urea. That this is really the case, I determined by direct experiment, a small portion of the urine with its fleecy sediment (in the case of Venkatasemoodoo) and which had yielded abundant distinct casts of the tubuli uriniferi was set aside till it had become strongly alkaline and again examined under the microscope. The casts before so distinct were hardly to be recognised, partly owing to the turbidity of the fluid from the deposition of the phosphates, but principally from the absence of the fibrinous matrix which had apparently been dissolved, and thus liberating all the contents of the casts.

The chemical examination should also always if practicable be instituted while the acid reaction exists. Albumen is not coagulable by heat if the urine be alkaline. It is true that nitric acid and heat, or acetic acid, heat, and nitric acid combined, and in the order enumerated, are sufficient for its detection; but the result is not so satisfactory as when the urine retains an acid reaction. I may be pardoned also for directing attention to the fact that under any circumstances the combination of heat and nitric acid is requisite to the detection of albumen, since the former (heat) may render the urine turbid by a deposition of the phosphates when they exist in excess; while the latter (nitric acid) may produce the like effect by a copious deposit of the lithates or lithic acid when *they* exist in excess; the former (phosphates) may be distinguished from albumen by being re-dissolved by a drop or two of nitric acid while the latter may be known from albumen by re-solution or heating the urine. A deposit or cloudiness which resists both heat and nitric acid can be only albumen.

To re-capitulate.—If the urine be examined soon after it is passed it will be found to have all the characters of that of Bright's disease, viz., an acid reaction, a red, reddish, brown, or smoky colour, or an amber deeper than that of health;

its transparency will be disturbed by a delicate fleecy cloud which shortly subsides; the supernatant urine will yield albumen in varying quantities sometimes being rendered evident only as an opalescent cloudiness, at other times falling as a dense bulky, white, yellow or red coloured deposit; the colour of this deposit depending upon the amount of the colouring matter of the blood present in the specimen; while the sediment will yield under the microscope, blood discs, epithelial cells in all stages of cell growth, nucleated epithelial cells with fibrinous casts of the tubuli uriniferi, either empty or filled with the preceding. These casts are most delicate microscopic objects and if empty are very likely to be overlooked unless the light (which must be somewhat subdued) be very carefully regulated. An achromatic microscope is indispensable to their detection.

The next subject for consideration is the *blood*. The author before quoted writes "The blood (in Bright's disease) is usually buffy, often excessively so; the density of its serum is much reduced if the urine has for some time been highly loaded with albumen; urea may be always detected in it, if the urine has for some time been greatly reduced in quantity; and when the disease has lasted for a week or two, the proportion of hæmatosin in the blood is found to be diminished; but in the commencement nothing unusual is remarked as to the blood but buffiness."

I have in two cases only of beriberi made a rough qualitative analysis of the blood and that only with reference to the density of the serum, and presence of urea. In one the blood was drawn early in the disease; in the other the disease had lasted some days and the urine had ranged only between 6 and 16 ounces, the mean being about 8 ounces (for many days) and highly albuminous.

The process adopted was that recommended by Dr. O'Rees the heat being carefully regulated. In the first case a *closed* steam bath was used for the evaporations; in the latter an *open* one. I mention this as I have since learned that the

closed steam bath sometimes affords too high a temperature for these investigations, risking the decomposition of the urea. I give the different stages of the proeess.

1. The serum was evaporated to dryness.

2. The residue was treated with distilled water at 200° Fahrenheit, being previously broken up with a sharp knife, and digested for half an hour.

3. The digested fluid was filtered and the residue washed with distilled water, the washings added to the original liquor, the whole filtered fluid evaporated to dryness and then digested with alcohol at a gentle heat for half an hour.

4. The digested extract was next filtered, again evaporated to dryness, and redissolved in a small quantity of lukewarm water.

5. A few drops of nitric acid were now added and the fluid set aside to crystallize.

In the first analysis (the blood of Shaik Audam) the serum had a sp. gr. of 1030, and the solution obtained by the last stage of the above process yielded no crystals immediately on the addition of the nitric acid ; but on material reduction by evaporation crystals formed. In the 2d analysis (the blood from the patient Venkatasemoodoo) crystals of nitrate of urea formed immediately the nitric acid was added.

The latter analysis is in every way, I believe, trustworthy and the existence of urea in the blood satisfactorily determined, the sp. gr. of the serum was 1023 only. In the first analysis I do not think urea was satisfactorily detected, indeed considering the early period at which the blood was drawn and the sp. gr. of the serum which was of the healthy standard, ureal impregnation was scarcely to be expected ; for as Dr. Christison writes in connection with Bright's kidney "in the commencement nothing unusual is remarked as to the blood but buffiness." I have before remarked that in both these cases the blood was buffed and cupped.

Adopting the same course as I have done in regard to the urine and blood, I have in connection with the pathology of beriberi and in prosecution of my attempt to trace a resem-

blance between it and Bright's disease, in the next place to examine the structural changes characterizing the different stages of the latter affection and then to comment upon the alterations noticed in the kidneys of the patient in the only case in which I have had an opportunity of examining the conditions of those organs in beriberi.

Dr. Christison in the clinical report before alluded to, observes, " the most important morbid appearances as to the kidneys are in the early stages of acute cases, the signs of bloody congestion both outwardly and in their intimate structure; in advanced cases of the same nature enlargement; for the most part lobulated, botryoidal or granular, yet sometimes too a uniform surface with injeeted reticulations of vessels in the hollows; and internally an invasion of the cortical and medultary structures and diminution of their usually distinct striated appearance, in consequence of the effusion of a heterologous matter generally of various tints of yellowish white into which the material of an injection passes very imperfectly or not at all. In chronic cases we may have the same appearances as in advanced acute cases; but often we find the kidneys not enlarged, sometimes even less than usual, occasionally atrophied to an extreme degree." In another place he writes further: " The congeries of alterations of the kidney described by Dr. Bright and his followers in the line of enquiry depend on at least two distinct morbid processes. One of these is of the nature of inflammation chronic or acute. The other is a morbid degeneration always chronic not inflammatory, analogous to what occurs in various other important organs and consisting in the morbid accumulation of fat or oil globules." The professor then goes on to describe the nature of the inflammatory process (to which form of the affection as I have before stated any remarks I may offer in connection with beriberi more especially apply) in the following words " the inflammatory process according to most observers consists in the preternatural formation of epithelial cells in the lining mucus membrane of the minute uriniferous tubes of the kidneys, and the detachment and desquamation of these

cells; so that by accumulating in the interior they obstruct the tubes and choke them up, there are also found in the obstructing matter, blood discs, pus-globules, uric acid crystals, and sometimes crystals of oxalate of lime, but the greater part of the mass consists of epithelial cells, entire or much more commonly degenerated, so as to be irregular in their edge, contracted in size or sometimes reduced actually to their nuclei;" and after telling us that these materials are often swept out of the urine tubes by the aqueous portion of the urine, adds, "but it does not always follow that the tubes regain their secreting function; for they may have been permanently deprived of their epithelial cells, no longer renewed or only in a degenerated form; that an important consequence of this sweeping out of the urine-tubes is, that we find in the sediment of the urine their morbid contents and these are" (here he enumerates the microscopic elements so often alluded to and concludes in these words) "this is one of the most important practical observations yet made in the course of the whole microscopic enquiry; for if exact it enables as to discover most readily with the microscope the nature of any particular case and to refer it to inflammatory action as its fundamental source."

We see then that the changes wrought in the kidneys affect both their size, figure and consistence; the colour and condition of their surfaces and interior; and that they depend upon the nature and stages of the affection. The large red and congested kidneys belonging to the first stage of the purely inflammatory kind; the contracted kidney with a pale and usually condensed cortical substance to the more advanced stages of the same forms. The speckled and granular kidney belongs to the fatty degeneration (stearosis) and is unconnected with inflammatory action.

With the latter form of the affection I have nothing at present to do. I would however direct attention to the detail of the examination of the kidneys in the case of Venkatasemoodoo, one was found to be enlarged and lobulated, both congested, both mottled and veined. In both the cortical

substance was increased in thickness; in one encroaching upon the medullary portion of the gland, in both the fluid scraped from the incised surfaces yielded all the microscopic appearances described by Dr. Christison as marking inflammatory action; the tubuli uriniferi being found full of degenerated cells and blood discs. But in all the cases detailed these microscopic elements have been detected in the *urine*, lending weight to the solitary post mortem examination above detailed, and placing it beyond a doubt that in all those cases the same pathological changes existed in the kidneys. How invaluable nay essential an instrument then must the microscope be considered in the future investigation of beriberi! Mr. Malcolmson, I may add, at page 339, Appendix to his Essay relates the results of the examination of the kidneys of an European soldier named White who died of Beriberi, and as far as an investigation conducted without the assistance of the microscope (at that time not in use as a means of diagnosis) goes, the examination satisfactorily established, such a pathological condition of those organs as has been above described. The words are as follows—"The kidneys were large with a considerable increase of pale cortical substance which was most remarkable on the right side where it encroached upon the internal structure of the gland which had an unusually pale striated appearance."

Having then, I trust, satisfactorily established in the cases adduced that the urine presented all the elements pertaining to that excretion as met with in Bright's kidney, and in one case detected urea in the blood; and after death, the morbid changes marking inflammatory desquamation of the epithelium lining the uriniferous tubes, I proceed in the next place to the consideration of those secondary affections, common both to Bright's kidney and beriberi, which arise out of the serous drain from, and detention of urea in the blood.

In connection with Bright's kidney we find detailed by writers as secondary affections dropsy (especially in the form of anasarca) dyspepsia (as evidenced by nausea, and vomit-

ing), chronic diarrhœa. Inflammations of the serous sacs (as pleurisy, pericarditis, and peritonitis,) bronchitis, congestive apoplexy, more rarely paralysis, more frequently epileptic convulsions, neuralgia, rheumatic pains, disease of the liver. Hypertrophy and valvular disease of the heart, phthisis.

The great majority of these complications have been noticed by various writers in connection with beriberi, some of them (especially the endocardial and pericardial inflammations) are very common and very fatal. The accompanying table exhibits the secondary affections which have complicated the few cases that I have had opportunities of observing, and of which I have kept records, and will strongly exhibit *this* point of similarity between the two diseases, the mode of death is also shewn as also the general conditions of the urine.

NAMES.	Dropsical Symptoms.			Cerebio-spinal Symptoms.					Thoracic Symptoms.			Abdominal Symptoms.			Urine.		Mode of Death.
	Œdema.	Anasarca.	General Dropsy.	Delirium.	Coma.	Numbness.	Anæsthesia.	Paralysis.	Peri and Endocarditis.	Œdema Pulm.	Bronchitis.	Disease of Liver.	Nausea, &c.	Diarrhœa.	Albumen.	Microscopic Elements of Bright's Kidney.	
Gooriah, - -	1	1	0	0	0	1	0	1	1	0	0	1	0	0	1	0	Syncope.
Mohomed Jaffer,	1	1	0	1	1	1	0	1	0	1	0	0	0	0	1	0	Coma.
Authenah, - -	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	Apnæa.
Mohomed Ackbar,	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	do.
Mohomed Hoosman, - -	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	1	Syncope.
Venkatasawmy,	1	1	0	0	0	1	0	0	1	0	0	0	1	0	1	1	do.
Ramasawmy, -	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	do.
Atchiah, -	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	do.
Hussurrapah, -	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	do.
Shaik Audam,	1	1	0	0	0	1	0	0	1	1	0	0	0	0	1	1	Syncope.
Ramasawmy, -	1	1	0	0	0	1	0	1	0	0	0	0	0	0	1	0	do.
Venkatasemoodoo,	1	1	1	0	0	0	1	1	1	1	0	0	0	0	1	1	Apnæa.
Peddapoor Moonsiff, -	1	1	0	0	0	1	1	0	0	0	1	0	0	0	1	1	do.
Coovah, - -	1	0	0	0	0	1	0	0	0	0	1	1	0	1	1	1	do.
Total..	13	9	1	2	1	12	2	5	6	5	2	2	2	2	11	6	

The natural termination of Bright's disease is said to be in

the way of coma unless the patient be previously cut off by some of the before noticed intercurrent inflammatory affections, the same would appear to apply to beriberi, the most frequent immediate cause of death being inflammation of the pericardium with effusion; or endocardial inflammation leading to changes in the valvular apparatus of the heart, or both combined.

But the symptoms which lend to beriberi its peculiar features are the "numbness" so generally complained of, followed in some cases by more or less affection of sensation and motion, together with cramps; pricking pains, tonic spasms, and in some few cases exalted sensibility of the cutaneous surface. Symptoms in fact referable to functional or organic lesion of the spinal cord and its membranes, the anæsthesia and loss of motive power evidencing affection of the cord itself. The cramps, muscular rigidity, &c. of its membranes. It appears that similar symptoms referable to the spinal cord are occasionally noticed in Europe in connection with Bright's disease; at least Dr. Christison alludes to paraplegia as an occasional complication. The same author also teaches us that the secondary affections noted in connection with that disease differ in different localities. According to Dr. Osborne meningitis is common in Dublin; while Dr. Christison says it is rare in Edinburgh. Locality again appears to influence the *form* of the disease. "The inflammatory (writes Dr. Christison) is much more common in this city than the stearotic form of renal disorganization; Edinburgh differing in this respect from London and Brussels where stearosis appears proportionally more frequent; but corresponding with Paris in which that degeneration seems comparatively rare." Seeing thus that locality, climate, &c. influence not only the secondary affections complicating Bright's disease, but even determine the *form* which it assumes, I would ask whether I have not adduced evidence as far as my observations go in favor of the proposition that beriberi is the inflammatory form of Bright's disease with a tendency to early implication of the spinal cord and its mem-

branes, as a secondary affection, owing to some unascertainable climatorial influences.

I have now disposed of the positive evidence in favor of the above expressed opinion, and have next to enter upon the consideration of the question, is inflammation of the substance of the cord or its membranes capable of inducing all or any of the symptoms noticed in connection with berberi especially the dropsy and cardiac affections? Or to use Mr. Malcolmson's words can inflammation of the spinal cord or its membranes "through actions induced by the affections of its nerves" secondarily produce dropsy, and inflammation of the serous membranes of the heart, &c.? I am quite prepared to admit that irritation of the nervous centres or of the trunk of a nerve may by extension of irritation along the different branches of that nerve induce inflammatory action in parts to which the nerve is distributed, and that irritation of the periphery of a nerve may be reflected from the nervous centres and produce pain, redness and other signs of inflammatory action in parts at a distance from the seat of irritation, these are however exceptional causes of inflammation and are scarcely to be taken into consideration in our attempts to define the causes of those inflammatory affections complicating beriberi and which I may add must be reviewed in association with the œdema and other dropsical symptoms. Mr. Malcolmson in support of his proposition affirms that "nervous irritation *always* leads to produce inflammatory action," and adds, "that the pericardium suffers in the way in beriberi is exceedingly probable, the symptoms of cardiac affection seldom appearing when there are not unequivocal signs of the part of the spinal cord above the origin of the nerves which assist in forming the cardiac plexus being more or less diseased," I doubt much whether this opinion can be supported, my own experience is decidedly opposed to it, so far from meeting unequivocal signs of inflammation of that segment of the spinal cord presiding over the functions of the heart in those cases on which either endo or pericardial inflammation existed, it has more frequently occurred to me to have no

evidence of spinal lesion whatever or nothing more than trivial numbness below the knees. The citation of one case then, in which death occurred by invasion of the membranes of the heart, at a time when no signs of spinal lesion existed, will outweigh a dozen where paraplegia or other signs of serious spinal disease did exist, for extensive implication of the spinal cord and its membranes may be equally explained upon the assumption of secondary inflammatory action through a morbid condition of the blood. In the case of Authenah for instance given in the table, there was no evidence of spinal lesion except the numbness of the legs, no anæsthesia, no palsy, while in Shaik Audam's case detailed at the commencement of this report, the numbness which had existed at the commencement was not complained of at all towards the close. But as regards the dropsical symptoms they certainly cannot be explained upon the supposition that inflammation of the spinal cord and its membranes, constitutes the first link in the chain of the morbid actions, pathology recognises cardiac dropsies, renal dropsies, acute dropsy, (a variety of renal dropsy since it seldom occurs, but in those whose kidneys are unable to respond to the increased demand made upon them through sudden arrest of the functions of the skin) and dropsies arising from debility; but we do not read of *spinal dropsy;* that is dropsy depending upon or originating in inflammation of the spinal cord or its membranes. I might prove this assertion by entering upon a consideration of the pathology of the spinal cord; but that I should be extending this report to too great a length; I will therefore only add that all these symptoms, the dropsy, the signs of spinal lesion, the endocardial and pericardial affections and other occasional complications of beriberi may be explained more consistently with existing pathological knowledge, by referring them to renal congestion or alterative and ureal impregnation of the vital fluid.

The alkaline condition of the urine in advanced stages of beriberi is often adduced as evidence of serious spinal lesion. The urine indeed is generally described to resemble that pass-

ed in cases of severe injury to the spine attended with paraplegia and paralysis of the bladder, in which the contained fluid is rendered alkaline by the secretion of a large quantity of mucus from the lining membrane of the viscus, and its reaction upon the urea. I have repeatedly examined the urine of beriberi cases in which this alkaline condition existed, and it has always occurred to me to find it *faintly acid at the moment of emission*; but speedily becoming alkalescent. It would appear then that the urine is secreted *acid* and leaves the bladder still *faintly acid*, though loaded with the phosphates as is shewn by its becoming turbid by heat. Now, if we examine the conditions of system giving rise to the phosphatic deposits we find that they are by authors stated to depend upon, or to be connected with four different morbid conditions. Dr. Bird for instance divided them into,

A. Cases in which dyspepsia with some febrile and nervous irritation exists independently of any evidence of antecedent injury to the spine.

B. Cases characterised by high nervous irritability with a varying amount of marasmus, following a blow or other violence inflicted on the spine but without paralysis.

C. Cases in which the phosphatic urine co-exists with paraplegia the result of spinal lesion and,

D. Cases of diseased mucus membrane of the bladder.

It is evident from the remarks of most writers on beriberi and especially Mr. Malcolmson that they refer the alkaline condition of the urine to the class of cases included in the 3d division. In some cases probably, those in which serious injury has been inflicted upon the spine or in which a considerable amount of fluid may be supposed to have accumulated in the spinal canal, such a condition may exist though I am satisfied such cases are exceptional. In no instance have I seen paralysis of the bladder nor do we in the reports of cases ever notice that it has been necessary to remove the urine by the catheter owing to a paralysed condition of the bladder, which would surely have been recorded had such an operation been required.

I am inclined then to the opinion that we must not look upon the alkaline condition of the urine as *necessarily* pointing to serious spinal lesion. Alkaline urine is noticed in all cases of great exhaustion of the nervous energy and especially in diseases of the nervous system. Dr. Bird writes "One general law appears to govern the pathological development of those deposits, viz., that they always exist with a depressed state of the nervous energy, often general rarely more local in their seat;" and in another place "where the triple salt occurs in small quantity nearly or entirely free from phosphate of lime, the urine being *acidulous* or *neutral* at the moment of emission not restoring the colour of reddened litmus till some time after, we have the simplest cases or those in which the amount of organic or functional lesion is at a minimum."

Further observations are required upon the alkaline condition of the urine in beriberi, and if it be ascertained that the urine is "acidulous at the moment of emission and the deposit consists of the crystalline form of the phosphate unmixed with the amorphous phosphate of lime, we may accept that the alkalescence is due rather to depression of the nervous energy than to serious spinal lesion. I would here remark that the condition of partial loss of power over the lower extremities, numbness, &c. remaining after the subsidence of the more acute symptoms belonging to beriberi should (according to the pathology of the disease I have advanced) be considered merely as the sequence of that affection, that in fact where a patient presents himself with these signs of spinal lesion and no evidences of renal alteration are detected by chemical and microscopical examination of the urine, it must not be decided that the pathological condition of the kidney before described *did* not exist and thus the views of the affections I have advanced be ignored. It would be as unfair in cases of valvular diseases of the heart, the result of antecedent acute rheumatism, to say that they were no evidences of rheumatism, because there existed no pain, tenderness and swelling of the large joints and no febrile disturb-

ance. In the one case (beriberi) the symptoms of spinal lesion are referable to antecedent renal disease, in the other (rheumatism) the signs of cardiac disease are referable to antecedent lithœmia. Both in fact are the *remains* of inflammation lighted up by a previous diseased condition of the blood.

The *causes* of beriberi have not been sufficiently investigated to enable me to decide, whether they are of the same nature as those noticed in connection with Bright's kidney. The latter affection is said to prevail most amongst the intemperate. I am not sufficiently conversant with the habits of the natives of India to decide whether the same applies to beriberi. The disease is generally considered to be most prevalent amongst Musselmen; but in the cases which have fallen under my own observation the preponderance is on the side of the Hindoo, ten having occurred in that class, while four only are Musselmen. Cold I conceive to be the immediate exciting cause in almost every instance: though it is probable that latent renal disease is at the bottom of every case and which is developed whenever the kidneys are called upon to compensate for any temporary arrest of the cutaneous function.

The *prognosis* in beriberi can scarcely be said to be more favourable probably less so, than that in Bright's kidney; on the probable terminations of the latter affection Dr. Christison writes, "the probable result of an attack of Bright's disease of the kidney is unfavourable, often extremely so;" some have thought it to be a desperate malady always fatal in the end, though often deceitfully persuading the patient and physician that it has disappeared; "and further on adds," complete recovery is rare amongst the intemperate or those of strongly strumous habit, and is probably unknown in that pathological form of the disease referable to fatty degeneration of the kidneys." Dr. Watson agrees in all essential points with professor Christison while Dr. O'Rees in acknowledging the great fatality attending the disease writes—" our inability to perform cures

must rather be attributed to the nature of the affection, than the want of perspicacity on the part of the profession." The purely inflammatory form is however acknowledged to be often amenable to remedial measures. This leads me to the consideration of the *treatment* regarding which I must say a few words in conclusion.

In my last year's report adverting to the evidence in favour of renal disease being the starting point in the pathology of beriberi; I ventured (assuming that the renal affection was of an inflammatory nature) to condemn the exhibition of stimulant diuretics and to inculcate the reduction of the renal congestion or inflammation by topical blood letting the administration of medicines acting by the bowels and skin, attempting to increase elimination through the kidneys only by the most unstimulating forms of diuretics. This opinion was subsequently expressed in a paper submitted to the Hyderabad Medical Society, and objections were taken by some of the members present at the discussion to my "practical deductions." As the opinion of a body of medical men on the subject of the paper generally may be interesting and of value, I give an extract from the epitomè furnished by the Secretary to the Society. "The meeting could not but be struck by the striking similarity between beriberi and granular degeneration of the kidneys which Mr. Ranking's observations appear to establish, a similarity so remarkable that it becomes a question whether what in India is termed beriberi is not a mere modification of what in Britain is termed Bright's disease. The only materies morbi which in the Indian malady has hitherto been proved to be detained in the blood is urea, the identical morbid element that is similarly detained in the British disease. The circulation of this excrementitious matter in the blood, predisposes in an english climate and an english constitution, to inflammatory affections of the fibro serous membranes of the heart and dropsy; in a tropical climate and asiatic constitution to inflammation of the fibro-serous membrane of the spinal cord and dropsy. The subject was acknowledged an interesting

one, deserving and demanding further investigation, and Mr. Ranking's view of the pathology of the disease was regarded as feasible and well supported; but several members were inclined to take exception to his practical deduction respecting the treatment of the malady. Mr. Geddes asserted that his own actual experience as well as that of the late Dr. Herelots had amply proved the efficacy of stimulating diuretics in both palliating and curing the disease, and it was further urged that the established utility of this class of remedies is not opposed to Mr. Ranking's pathological views. In many chronic cases the renal congestion is probably of a passive character and in such instances stimulants are doubtless highly beneficial, they are exhibited with manifest advantage in passive congestion elsewhere; in the lungs for instance and in the eyes, stimulating collyria often act like a charm in discussing vascular engorgement of the conjunctiva, and their operation is sometimes assisted by the use of internal tonics and wine."

I cannot for a moment dispute the testimony offered by Dr. Geddes supported as it is by extended experience; but I am quite prepared to join issue with those gentlemen who discuss the probable influence of stimulating diuretics by a reference to the pathological condition of the organs. I am prepared to admit that in congestion stimulants are often of use and under two very opposite *conditions* of congestion, or rather I should say in congestion depending upon two very opposite pathological conditions of the blood vessels.

Dr. Williams in his principles of medicine allows this; but at the same time admits that stimulants often fail to clear the congested vessels; "the enlarged arteries pour in more blood; but this not overcoming the obstruction increases the hyperœmia and * * may convert it into inflammation." Although then I repeat that (considering congestion as it occurs generally) I admit that stimulants may and often do prove remedies, not only for passive congestion but even for active congestion if administered at its very onset; yet I am not prepared to admit that the law

holds good as refers to congestion of the kidneys. Congestion in these organs arises from a different pathological condition altogether, and this condition is a preternatural formation of epithelial cells in the lining mucus membrane of the minute uriniferous tubes of the kidneys, and the detachment and desquamation of these cells; so that by accumulating in the interior they obstruct the tubes and choke them up. "This over distention of the uriniferous tubes produces *mechanical* congestion of the renal capillaries leading to transudation of the serum of the blood and even of the red particles themselves:" so long then as this over distention of the uriniferous tubes remains it is in vain to expect to relieve the vascular congestion by the exhibition of stimulant diuretics. By increasing the elimination of the *watery* part of the urine, we may by washing out the uriniferous tubes relieve the congestion. Hence we find in the treatment of Bright's disease in Europe, diuretics of the mildest nature only are prescribed and with the above mentioned object, viz. the ablution of the urine tubes. Dr. Christison prescribes generally cream of tartar with digitalis; writing on this subject he says the stimulus caused by diuretics may well be supposed to differ entirely from the peculiar irritation which gives rise to either inflammatory or stearotic degeneration * * *. Besides is there no likelihood of advantage from diuretics *sweeping out* the *tube-casts and other matter obstructing* the *uriniferous* tubes? "but mark what his diuretics are!" "the best diuretics are in my opinion, digitalis, squill and bitartrate of potass taken simultaneously." We do not find that he exhibits the teribinthinates or tincture of lyttæ. Dr. Watson even *as a rule condemns the use of diuretics at all;* and tells us that we had better avoid them, and attempt to relieve the dropsical symptom by the bowels and skin. In chronic cases where all evidences of inflammatory action as furnished by the microscope have subsided, stimulant diuretics may be of service on the supposition that the vessels may retain a state of atonic dilatation and congestion consequent upon the mechanical compression to which they had so long been subjected,

though even in these cases it may be doubted whether they may not do harm, for we have seen that "it does not always follow that the tubes regain their secreting function" in which case stimulation would not have a beneficial effect.

So long as tube-casts, and abundant cell growths are thrown off in the urine my advice would be to abstain from all *stimulant* diuretics; leech or cup the loins and attempt the washing out of the obstructing matter in the urine tube by *mild* diuretics administered in large quantities of water. I might have supported my views on this point by quoting at length the opinions of the authors named; but this report has been already extended beyond the usual limits.

In conclusion, I cannot refrain from directing attention to the cases of beriberi detailed in the medical reports of the Madras Army for the year 1850. Surgeon Lawrence especially notices the subject and gives a number of cases, some connected with or following rheumatism, some following diarrhœa, others in which heart affection was the prominent symptom, and all I believe to be accounted for upon the supposition of antecedent or existing renal disease. A more systematic examination of the urine in cases of this description will, I feel confident, completely verify the following remark by Dr. Christison, "It (Bright's disease of kidney) ought always to be looked for by a prudent practitioner in all cases of protracted or frequently recurring dyspepsia, diarrhœa, neuralgia, chronic rheumatism, catarrh, anasarca, and those cutaneous eruptions which exhaust the constitution." I need scarcely add that cardiac disease should always be investigated with reference to its possible connection with antecedent renal disease or acute rheumatism. It is surprising and much to be regretted, that so little attention has been paid in India to the examination of the urine as a means of diagnosis. In this accusation of inattention to and neglect of so valuable a means of diagnosis I include myself. In 1848 it was remarked by Dr. Golding Bird that "the examination of the urine in disease is now regarded as one of the most important aids in diagnosis and which it would be alike *injurious*

to the welfare of the patient as to the credit and reputation of the practitioner to avoid;" and yet we do not find in the most recent issue of reports from Medical Officers in charge of regiments, zillahs, &c. any further notice of the urinary excretion than is conveyed in the words "scanty and high coloured" or other scarcely more valuable remarks; that I am not stating what is not strictly true can be determined by a reference to the Reports from the Records of the Medical Board for the year 1848, published in 1850. "It is a common opinion that a native charge offers little of interest in a professional point of view; but many of these reports will shew the contrary" is remarked in a prefatory memorandum to the above-mentioned valuable medical reports. I am satisfied that the concluding portion of the sentence will be fully borne out if attention be directed to disease of the urinary organs *alone*, which my experience tells me mask and complicate many of the diseases to which natives are liable, and which it is my intention hereafter to prove by a collection of cases which have occupied my attention in military and civil practice.

Since concluding the above report, a case has occurred in the civil dispensary at this station, so intimately bearing upon the last offered remark, and presenting symptoms so closely allied to those detailed in some of Mr. Lawrence's cases, and I may add so nearly allied to many of those characterising beriberi, that I may be pardoned for abstracting it.

Maregandoo, was admitted into the civil dispensary, on the 22d September, with disease of the bones of the left foot and extensive ulceration with sinuses leading to the diseased bones which were the astragalus and os calcis. He was a stout indeed a fat man, but had the broad flat nose and thick lips of the scrophulous diathesis which also exhibited itself by other unmistakable signs; the ulcers were attempted to be healed by rest, &c.; but without success, and about the middle of December he was urged to submit to amputation, but would not consent; he was accordingly continued as an

inmate of the Hospital though without any hope of affecting a cure. On the 3d of January, he complained of tense œdema of the chest and back, and on questioning him he alluded to his urine being scanty and high coloured, he had no pain in the loins, but the urine was albuminous. He was ordered leeches to the loins, purgatives and mild diuretics with hot baths and flannel roller to the loins. The next morning he was much in the same state and the Dresser informed me that he had refused the leeches; he was slightly feverish but not looking ill, the urine was only six or eight ounces, albuminous; the microscope revealed the usual elements of inflammatory desquamation of the epithelial cells of the urine tubes of the kidneys; leeches were again ordered and the treatment continued. The following day sudden dyspnœa set in; he was cupped over the chest, had ether and chloroform, but expired in a few hours. The body was examined; the kidneys were found congested; the cortical substance increased and mottled. The fluid scraped from the sections and pressed out of the mamillary processes yielded tube casts, full of cells, mostly fatty and independent oil globules.

The pericardium contained five ounces of clear serum; the valves were slightly thickened and their free borders highly congested; both sides of the heart contained partly fluid and partly coagulated blood. The lungs were crepitant and free, but turged with serous infiltration; pressure (on incision) causing an exudation of copious frothy serum; the case is more fully reported and commented upon in the following report for the civil dispensary.—See page 219.

RAJAHMUNDRY,
1*st January*, 1852.

Extract from the Annual Medical Report for the Station Rajahmundry, 1851 *and* 52.

By Assistant Surgeon J. L. Ranking.

It only remains now for me to notice those cases which have proved fatal, or otherwise present features of interest.

1st. The case of "carditis," which was suddenly fatal, occurred under the following circumstances:—

Naugiah, private 8th regiment, was admitted at three P. M. of the 25th December, the symptoms being those referable to serious impediment to the respiratory functions; the patient could only sit up, grasping his knees (much as an asthmatic patient does), and struggle for breath, the pulse was imperceptible and the body bathed in cold sweat. He could not speak so as to give any history of himself and his distress was so urgent as to render any careful exploration of the chest impossible. The cardiac region was however extensively dull on percussion, and the heart's sounds very faint while the respiratory murmur was faint and masked by mucous rales; symptoms denoting copious effusion into the pericardium, with œdema of the lungs. He expired at six P. M. The death was reported to the commanding officer, who directed that the body should not be removed pending an enquiry. It was however taken away and burnt, the friends stating that they misunderstood the order. An enquiry elicited that he had been subject to beriberi, that he would not come to hospital, and that as he had taken all his tours of guards, &c., and did not appear to be ill, his comrades had not brought him to the notice of the orderly naigue.

Case 2d. Rheumatism followed by anasarca and death.

Bermiah, private 9th regiment native infantry, was admitted into the station hospital on the 2d of November 1851, with general anasarca; his history was as follows:—Had been under treatment for chronic rheumatism at regimental head quarters and left Secunderabad on sick certificate, on

the 14th of March 1851. Reported his arrival at this station in July, at which period though weak and emaciated he complained only of slight rheumatic pains. He was permitted to reside at his village; but was ordered to present himself each month at the hospital. In October he absented himself and was brought in on the 2d of November with the following symptoms which evidently pointed to an advanced stage of renal disease; "considerable œdema of feet and legs, and also of hands and body, with puffiness of the face. Pulse 100 small, skin moist and above the natural temperature; tongue furred with bright red-edges, urine scanty, 8 ounces in 24 hours; turbid, of deep reddish brown colour; sp. gr. 1·024, reaction neutral, depositing copiously, and yielding a deposit of albumen to heat and nitric acid. The microscope revealed blood globules, pus globules and fragmentary purulent casts of the tubuli uriniferi. He was ordered tonics (sesqui-chloride of iron) with diaphoretics and compound squill pill at night, and a warm bath every second night. On the evening of admission dyspnœa set in with some amount of cerebral oppression; physical exploration of the chest revealed the signs of œdema of the lungs, with, (probably) pericardial effusion; he expired on the morning of the 4th. This was a well marked case of organic renal disease in the advanced stage, as indicated by the presence of pus globules in the urine with purulent casts, and supports a remark made by Dr. Christison, noticed in one of my former reports, viz. "that organic renal disease should always be looked for in long standing cases of chronic rheumatism." In the foregoing case the existence of this renal affection was not suspected till too late.

I shall conclude this report by giving the result of a series of analyses of the urine of two beriberi cases, suffering under the chronic form of the affection, undertaken more especially to determine the cause of the high acidity of the urine, noticed in some stages of the affection; but which may tend

to throw some light upon other points connected with the general condition of the renal excretion in this affection.

As the cases alluded to, presented some points of difference as to general symptoms, it will be necessary shortly to abstract them, appending to each the results of analysis of the urine made periodically and also detailing the steps of the process so that in the event of other members of the profession wishing to follow out the same researches, or the Board considering the remarks of sufficient value to induce them to issue instructions on the subject with a view to the elucidation of the pathology of a disease so very fatal, uniformity of manipulation may be ensured which can alone lead to satisfactory results.

The steps of the process (and which is that recommended in the last edition of Dr. Golding Bird's work on urinary deposits) are as follows :—

Three separate portions of urine (the first passed after rising in the morning) of a fluid ounce each, are to be carefully measured into three separate porcelain capsules. One portion is gently warmed and poured into a conical glass, and half a fluid drachm of muriatic acid is to be added, the vessel is lightly covered and set aside for 24 hours, crystals of uric acid will crystallize upon the bottom and sides of the glass; these are to be carefully collected, dried and weighed. We thus obtain the quantity of uric acid in one ounce of the specimen, and by a simple rule of proportion can determine the quantity resident in the whole quantity passed. A second portion is evaporated over a *steam* bath to the consistence of a syrup, the capsule is then placed over a freezing mixture, and one drachm of cold colourless nitric acid added, the impure nitrate of urea is collected, dried and weighed; every 100 grains of which are equal to about 48 grains of urea.

The third portion is evaporated to dryness, removed to a shallow porcelain crucible and ignited, being kept at a bright red heat for a about ten minutes; when cold the residue is

collected and weighed and exhibits the amount of inorganic salts in the quantity experimented upon.

We thus obtain the quantity of,

Uric acid Urea, Inorganic salts,	} in 1 oz. (fluid) of urine.

The amount of solids and water can also be determined from tables founded upon the specific gravity of urine, and which tables are given in the work alluded to; and if it be wished to carry the analysis further, the amount of organic extractive matters can be readily (approximatively) determined by substracting the aggregate weight of urea, uric acid and inorganic salts, from the whole amount of solids as determined from the tables. A series of such observations would be highly valuable; the whole operation occupies about three hours (with the exception of the determination of the amount of uric acid) and the only difficulty is the separation of the urea, owing to the necessity of keeping the fluid during every step of the process at a very low temperature. In stations where ice is procurable the process is simple and easy. Having briefly described the nature of the analytical process, I proceed to give short abstracts of the two cases in which the urine was thus examined and the results of the operations.

Havildar Jegganaikooloo was admitted (by transfer on sick certificate from the 47th regiment) into the station hospital on the 25th January 1852, with symptoms of beri-beri, he was a fine stout man; but his countenance was leucophlegmatic, his skin was moist, tongue clean, pulse soft and regular, and there were no signs of cardiac affection, he in fact complained only of slight numbness and œdema as high as his knees, there was no awkwardness in his gait, but on walking or standing erect for some time he had pain of an aching character in the back. The case therefore must be considered a mild one; and I shall only remark further in connection with the symptoms, that they never at

any period assumed a more serious character, and that at the present time, he is residing at this village with only very slight numbness about the feet.

The urine was examined very frequently ; *was never albuminous* but always exhibited under the microscope abundance of nucleated and fragmentary epithelium, blood discs, with a few delicate empty casts of the tubuli uriniferi ; establishing the existence of that form of renal disease which has been termed " desquamative nephritis," in a mild degree, and also the fact that microscopical examinations of the urine are much more valuable in the detection of this disease than chemical tests. In a case lately brought to the notice of the Hyderabad medico-physical society by Dr. Maillardett and which terminated fatally, that gentleman proved the existence of renal disease by the former method of examination, though the latter (chemical tests) failed to detect the presence of albumen.

The results of the chemical analysis of the urine of this patient (Havildar Jagganaikooloo) is exhibited below.

Date.	Specimen examined.	Quantity in 21 hours.	Specific Gravity.	Approximative analysis of specimen shewing the amount in grains of urea, uric acid and inorganic salts with Animal extractives.
Jan. 26th	U. S. * * Morning urine, or urina sanguinis.	„	1·025	Aggregate amount of solids in one fluid ounce in grs. 25·50 One fluid ounce { Urea,............ 3·11; Uric acid,........ ·50; Inorganic salts,... 7·; Animal extractives, 14·89 } Total grs. 25·50
29th	Avge. of 24 hours. Average specimen of 24 hours.	26 oz.	1·020	Aggregate amount of solids in f. 1 oz. grs. 20·79 in f. 1 oz. { Urea,. .... 4·08; Uric acid,........ ·10; Inorganic salts,. . 5·75; Animal extractives, 10·86 } 20·79

Date.	Specimen examined.	Quantity in 24 hours.	Specific Gravity.	Approximative analysis of specimen shewing the amount in grains of urea, uric acid and inorganic salts with Animal extractives.	
Feb. 2d	Avge. of 24 hours.	18 oz.	1·030	Aggregate of solids in f. 1 oz.	31·49
				Urea,............ 6·16 Uric acid,........ 1·50 Inorganic salts,... 10· Animal extractives, 14·23	31·49
9th	U. S.	,,	1·030	Aggregate of solids in f. 1 oz.	31·49
				Urea,............. 6·05 Uric acid,........ 1·50 Inorganic salts,... 8·25 Extractives,...... 15·69	31·49
11th	U. S.	,,	1·024	Aggregate of solids in f. 1 oz.	25·05
				Urea,.. .... 5·70 Uric acid,... . .. ·25 Inorganic salts,... 5·50 Animal extractives, 13·60	25·05
Mar. 1st	U. S.	,,	1·023	Aggregate amount of solids in f. 1 oz.	29·33
				Urea,............ 11·76 Uric acid,........ ·38 Inorganic salts,... 7· Animal extractives, 10·19	29·33

On examination of this table the main points which attract attention are, first, the general deficiency and steady increase of urea, the general excess of uric acid; and the great excess of those constituents of the urine called *extractives*, consisting of the colouring matter of the urine, hippuric acid, creatirrine, &c. No particular value is claimed for these examinations since in the first place they are deficient in not in every instance being undertaken with reference to the total amount of urine excreted in 24 hours (and no analysis is of value unless it can fairly be assumed to shew the average composition of the urine of 24 hours) and secondly because being the first of the kind instituted, it may fairly be alleged that many errors exist, still it may not

be uninteresting to draw attention to those analyses in which the quantity of urine excreted in the 24 hours is also shewn; thus on the 29th the urine of the 24 hours was 26 ounces, and if we multiply the products of the analysis of f. 1 oz. by 26 we obtain, as the result.

Urea, - - grs.	4·08 by 26 =	106·08	540·54 grs. of solids in 24 hours.
Uric acid, -	·10 by 26 =	2·60	
Inorganic salts, -	5·75 by 26 =	149·50	
Animal extractives,	10·86 by 26 =	282·36	

The probable mean composition of the urine of 24 hours is according to Dr. G. Bird as follows:—

Urea, - - (grains)	270·	Total. . 592·1
Uric acid, - - -	8·1	
Inorganic salts, - -	138·	
Extractives, - - -	176·	

Comparing this with the above analysis of Jegganaikooloo's urine we find a deficiency of urea and uric acid, a slight excess of fixed salts and a great excess of the extractive matters; and on referring to the table it will be seen that under treatment (the patient slowly improving in general health) the proportion of urea and uric acid steadily increased, (the latter existing in considerable excess and accounting for the highly acid reaction of the urine) while that of the animal extractives and inorganic salts diminished. Does this relation between the amount of urea and extractives always obtain in beriberi?; this is a point certainly worthy of investigation.

The other case of beriberi in which the same analytical examination of the urine was instituted, was also of a chronic character but associated with cardiac disease. The urine possessed totally different characters being pale, abundant and of low sp. gr., faintly albuminous, but not persistently so, and always yielded under the microscope abundant casts and other elements of kidney disease. There existed staggering gait, leucophlegmasia, numbness but no œdema; breathlessness, tumultuous action of heart, (which pulsated

at the ensiform cartilage instead of at its normal site) a purring tremor and distinct bruit with first sound, and a puffy condition of the eyelids. The urine had generally a specific gravity of 1·010-1·012 and averaged 47 ounces in the 24 hours. Although then its *general* characters differed much from those exhibited in the case of Jegganaikooloo ; yet analysis shewed a very similar constitution, viz. a deficiency of urea with great excess of extractive matters. One analysis only is given in exemplification.

1*st February* 1852.—Urine of 24 hours 47 ozs. sp. gr. 1·012 colour pale amber, reaction acid.

Aggregate of solids in one fluid ounce, grs. 12·37

Urea, - - -	·24	multiplied by 47 (the number of ounces of urine in 24 hours).	11·28
Uric acid, -	·25		11·75
Inorganic salts, -	2·		94·
Extractive matters and albumen, -	9·88		464·36
	12·37		581·37

Shewing a great deficiency of urea, (so great as to throw doubt over the correctness of the analysis) a considerable increase of uric acid, a deficiency of salts and a great excess of extractive matters mixed with albumen. In so far then as regards deficiency of urea and excess of extractives there is an agreement in the two cases. It has before been remarked that it is more than probable that these analytical examinations are full of error, they are nevertheless given with the hope that others may consider the process "sufficiently simple and easy of execution" to induce them to contribute their mite towards the elucidation of the pathology of beriberi.

In conclusion I take this opportunity to notice that many years ago the same view relative to the proximate cause of beriberi, vizt. that it is *associated with disease of the*

kidney of an inflammatory nature, was propounded by Dr. Lorimer altogether unknown to me. It is highly satisfactory as observed by the Medical Board to find that independent observation and research, should lead to the same pathological views.

J. L. RANKING,
Assistant Surgeon.

RAJAHMUNDRY,
1*st April,* 1852.

EXTRACT FROM THE MEDICAL REPORT OF THE CIVIL DISPENSARY, RAJAHMUNDRY, FOR THE YEAR 1851.

By Assistant Surgeon J. L. Ranking.

Medical Cases of great interest have come before me and I have no hesitation in saying that medical practice amongst the natives of India (with the *one* draw back of the difficulty of verifying diagnosis by post mortem examination) is attended with as much satisfaction and interest in a professional point of view (that is as concerns the nature of the diseases met with, and their investigation) as pertains to the practice of medicine in Europe or amongst Europeans in this country. In corroboration of this statement I propose to abstract a few cases from the hospital journal. It has been a source of much disappointment to me, that many cases of the highest interest have not been watched to a termination, the patients getting dissatisfied with the treatment and leaving the institution secretly often; also it has happened to me that parties have only attended (as out patients) *once,* and this notwithstanding that the most careful and patient investigation was made of their cases. In the course of such investigations I was struck with the extreme frequency of renal diseases, (Bright's disease of the kidney) and affections connected with functional derangement of those organs. As I have become of late

most strongly impressed with the necessity of instituting microscopical and chemical examinations of the urine as a means of diagnosis in the diseases of the natives of India, I shall select two or three cases in which such examination have led to a correct diagnosis. I fear I lay myself open to the imputation of estimating too highly in a diagnostic point of view frequent examination of the urinary excretion, but I do not think such examinations can be too earnestly urged, since I am satisfied, that they tend materially to elucidate many of the obscure diseases of the natives of this country. On the importance of such examinations Dr. Watson writes "I do not hesitate to say that a rightly instructed person, might form a more accurate opinion respecting a sick man 50 miles off, and prescribe for him more judiciously upon being furnished with a phial of his urine, than some practitioners whom I have known could do if they had the patient bodily before them ; you may learn much (and so no doubt you ought) by prying into the arcana of the night chair, but you may learn more, I am persuaded by the habitual perusal of the chamber pot."

Case 1st.—Extensive ulceration of both groins, scrotum and perineum, of syphilitic origin followed by anasarca and death.

Ramasawmy, aged 35, Gentoo Cooly, was admitted on the 20th of May 1851, with extensive ulceration of the inguinal regions, involving the scrotum and extending along the perineum to the anus, the ulcers were callous with elevated and indurated edges, spongy and readily bleeding; the sores were traced to venereal origin, three years previously. He had been under different native practitioners and was during the year 1850 for two and a half months an inmate of the civil hospital at Masulipatam, which institution he left without having derived much benefit and with extensive ulcers in the groins; he

was ordered iodine internally and iodine dressings to the sores; which medicines were continued till the 11th of July; and as no benefit had apparently resulted from their use and administration, he was ordered fish liver oil one and a half drachms three times daily, and the same oil was used as a dressing to the sores. The first few doses induced diarrhœa, but this was checked by the addition of laudanum, and the oil continued till the 4th August, when it is reported "sores look more healthy, granulations smaller and more florid and discharge purulent instead of sanious;" on the 18th however he was worse, the ulcers had degenerated and œdema of the lower extremities was noted. From this period he got worse, the urine was examined and found to be scanty and turbid, and afforded all the chemical and microscopical elements of Bright's disease of the kidney. This discovery led to a most unfavourable prognosis; he daily grew worse and expired on the 1st October.

This case is instructive as shewing the influence of renal disease upon the vital powers. The degeneracy of the ulcers and the obstinacy with which they resisted measures calculated to induce healthy action are to be accounted for upon the supposition of the existence of organic renal disease and consequent degeneracy of the blood, prior to the appearance of the anasarca, which first awakened attention to the possibility of existence of such disease, and which when once detected fully accounted for the condition of the sores and forbade hope of recovery.

Case 2nd.—Dyspepsia connected with the formation of oxalic acid and its elimination by the kidneys in the form of oxalate of lime (oxaluria).

Marriah, Gentoo, admitted 2nd November 1851, complaining of uneasiness at the epigastrium, constipation, flatulent distension of abdomen, loss of appetite, gastrody-

nia and other symptoms of aggravated dyspepsia of three years standing. He was ordered mild warm aperients with bismuth, hydrocyanic acid and bitters with some benefit. On the 9th consequent upon his stating in reply to questions that he was, very frequently disturbed at night to pass his urine, the excretion was ordered to be kept and the following are the notes of its examination. "Quantity 30 ozs. pale whey-like, acid, sp. gr. 1·015, without deposit and not albuminous;" at this period it was examined microscopically, but on the 10th it was more carefully attended to and reported to be of sp. gr. 1·025, of a yellow colour, acid reaction, reduced in quantity, (about 20 ozs.) and very faintly albuminous, while the microscope detected groups of blood discs, abundance of nucleated and fragmentary epithelium with octohedral crystals of oxalate of lime, many very large and a few casts of the tubuli uriniferi, these latter somewhat doubtful. He was now ordered, as recommended by Dr. G. Bird in these cases, colchicum with bitters and Dover's powder at night. He was confined to a diet of milk, meat, and bread; sugar and all substances capable of conversion into sugar, being rigidly excluded, improvement followed this treatment; but as fresh evidence was obtained of casts of tubuli uriniferi in the urine, and that excretion continued scanty and highly acid, he was ordered in addition, cream of tartar with digitalis as a diuretic. The urine increased, and many of his dyspeptic ailments gave way, the skin however remained harsh and unperspirable and the pulse morbidly high. He however went on satisfactorily but absconded in the night of the 26th.

This case is not only interesting from the fact of its proving that the oxalic diathesis is met with in the native, (and as I have since ascertained is common) as well as in the European, but that its existence produces exactly the same train of symptoms, and consequently, that

the importance of ascertaining its presence is great. Dr. Watson teaches us "that persons who manifest this disposition are usually dyspeptic, sometimes very much so, sometimes very slightly, they are uneasy during the assimilation of their meals, suffer flatulence when the stomach is empty;" and regarding the treatment writes "the formation of the oxalate of lime within the body depends according to Dr. Prout either upon the non-assimilation of oxalic acid taken with the food, or upon the mal-assimilation of saccharine aliments, hence as a general rule both curative and prophylactic, sugar, and other saccharine substances should be rigidly excluded from the diet of these patients." Dr. Bird agrees in all essential points and in addition speaks strongly in favour of colchicum which he states, remarkably influences the character of the urine, causing the oxalate of lime to be replaced by uric acid.

I would direct attention to the notice of casts of tubuli uriniferi and slight albuminous impregnation of the urine in this case. Dr. Golding Bird remarks in connection with oxaluria as occurring in England "I have as yet seen no instance of a complication of the oxalic affection with granular degeneration of the kidneys." It is worthy of investigation whether this remark holds good in India. In a case of a sepoy in the garrison hospital at this station who was passing large quantities of oxalate of lime in his urine, the fluid was also slightly albuminous and contained casts of the tubuli uriniferi. In connection with this latter case I may here remark that I believe it occurred to me to find a new form of oxalate of lime not described hitherto; and of which I made a drawing at the time. It appeared either as oval bodies with a dark margin and central spot, isolated and in groups, or as irregularly ovoid and spherical, with broad dark margins, but without central marks; on causing these

latter to roll over, they assumed the appearance first described, which appeared to depend upon a small projecting portion, which as it assumed a given position in relation to the crystal appeared as a central spot.

These appearances are represented in the margin and are apparently modifications of the dumb bell crystals described by Dr. Golding Bird, which he mentions occasionally assume a spheroidal shape, but does not describe as ever presenting the central nucleus, which, I may add of the crystals, are small and in masses giving them much the character of blood discs for which they might be mistaken.

Case 3rd.—Dyspepsia connected with the cystic oxide diathesis. Bagavantrow, Brahmin, aged 25, a spare looking man, skin covered with a scaly eruption, belly tumid; was admitted on the 10th December 1851, complaining of various dyspeptic symptoms the most prominent of which were griping abdominal pains, with much flatulent distention especially after meals; three or four clay coloured stools daily, thirst, impaired appetite, morbidly clear tongue with red edges, pulse 80, skin moist and unperspirable. Had syphilis and bubo two years before admission; urine said to be scanty and passed frequently. A specimen passed in my presence had a smoky but distinctly green colour, and was turbid and acid; this specimen was carefully examined and the results noted are as follows; "colour apple green with a smoky hue, turbid, with a fleecy deposit which slowly subsided as a dense but easily diffused sediment at the bottom of the vessel, the supernatant urine slightly coagulable by heat and nitric acid. On standing, it retained its acid reaction

and deposited copiously; the deposit consisting of the pale variety of urate of ammonia mixed with hexagonal plates of cystic oxide, the urine boiled (to dissolve the urate of ammonia) thrown upon a filter and the residue treated with ammonia, yielded a clear deep green solution which on evaporation gave a crystalline matter of a greenish yellow waxy appearance, arranged in an arborescent manner much resembling the vegetation of the cactus. This was instantly resoluble in ammonia, and a drop evaporated on a slip of glass under the microscope yielded plates of cystine mixed with octohedra of chloride of sodium, which form that salt assumes, when impregnated with urea. So little is known regarding the pathological origin and indications of this deposit (cystine or cystic oxide) that remedies were directed principally to the restoration of the assimulative functions, and consisted of mild mercurials (to correct the hepatic secretions) warm cordial aperients and mineral acids, which Dr. Prout has used with benefit in such cases. The patient in a few days not deriving that immediate benefit which he had probably contemplated left the institution. I should have mentioned that in this case also the microscope revealed a few empty casts of the tubuli uriniferi with great abundance of nucleated epithelium. Regarding the cystic oxide, Dr. G. Bird remarks "these cases have been observed too seldom to allow of any accumulation of experience." The diathesis may be more common amongst natives, and it may remain for the Indian practitioner to explain the pathological origin of, and indications of treatment in, this deposit. The symptoms in this case much resembled those detailed in Marriah's case which was one of the oxalic acid diathesis. I need scarcely say that the yellow waxy arboraceous crystalline matter noted, is not a form of crystallization described as pertaining to cystine, though that substance was obtained from it on resolution in ammonia, and ra-

pid evaporation on a slip of glass; may the arboraceous arrangement be considered as due to the slow crystallization of cystine, chloride of sodium, and urea. The cubes of chloride of sodium assume an octohedral figure when mixed with urea, may not the triple compound of urea, chloride of sodium and cystine also suffer an alteration in its crystallization?

CASE 4TH.—Anasarca terminating suddenly by effusion into the pericardium and œdema pulmonum, connected with the stearotic form of Bright's disease of the kidney.

Marrigandoo, was admitted on the 22d September 1851, with ulceration of the right foot connected with disease of the bones. He was a stout, indeed a *fat* man; but eminently scrofulous. The ulcers refusing to heal, amputation was proposed, but objected to, the patient begging that further attempts might be made to heal the ulcers. On the 28th December he brought to my notice at my morning visit that he had some tense anasarca of the body and the face puffy. He appeared however in his usual health and there was no fever, or other signs of serious illness. His urine which he said was scanty was ordered to be kept. Leeches ordered to the loins, and a purgative with cream of tartar and tinct. digitalis as a diuretic; he refused the leeches, and the next day was much in the same state and there was slight dyspnœa; the urine was found to present all the microscopic elements of the stearotic form of Bright's disease; the patient was cut off suddenly by pericardial effusion and œdema of the lungs.

The body was examined 16 hours after death, it was very fat, there was serous effusion into the cellular tissue of chest and back, muscles pale and flabby. The lungs occupied the whole chest and protruded from it on removing the sternum. There were no plural adhesions

and no structural disease of the lungs themselves, which were crepitant throughout, but gorged with frothy serous fluid. The pericardium contained about five ounces of serum, clear and unmixed with flakes of lymph, but greasy and loaded with oil globules. The heart was large, pale, flabby and loaded with fat, both sides full of blood partly fluid, partly in loose coagula, lining membrane pale, but the free margins of mitral and bicuspid valves bright scarlet and slightly thickened; aortic and pulmonary valves unaltered. The liver was only examined in situ, was of natural size but congested; on incision, it did not leave a greasy stain on the knife and was therefore judged to be free from fatty degeneration. Stomach distended with fluid, (conjee water which had been taken some hours before death) lining membrane pale, peritoneum pale, intestines pale, and distended with flatus, not diseased; omentum loaded with fat, spleen of natural size and appearance.

Kidneys.

Right kidney	weighed,	3	ozs.	3	drachms.
Left	,,	,,	3	,, 4	,,
Heart	,,	,,	9	,, 1	,,

Both kidneys congested, blood dripping on section, mottled externally and smooth; the right had two small cysts containing clear serum on its surface. The investing membrane was removed from both with the natural facility; on section the cortical substance of both kidneys was paler than the medullary, and had a mottled appearance, and the natural striæ were more or less obliterated. It was also thicker, that is *deeper* than natural, being quarter of an inch in the narrowest portion, while it also encroached upon and intruded itself between the medullary portions.

The medullary substance itself was highly congested

though on scraping away the fluid, from the incised surfaces, there was an evident interposition of pale matter which had a striated arrangement and predominated over the vascular striæ; the mamillary processes were turgid and deep red; but appeared pale on a transverse section, and the fluid pressed from their extremities and scraped from their incised surfaces, presented under the microscope tube casts full of fatty epithelium, oil globules, blood discs and (crystalline masses of fatty matter)?. This case is highly interesting in many points of view. 1st. It establishes the fact of the existence of stearosis or fatty degeneration of the kidney (to which form the term Bright's kidney, is restricted by many European physicians) amongst the natives of India.

2d. It eminently shews how serious a disease may exist without declaring itself by any marked symptoms, until within a very few hours of death, unless evidence be sought for by a microscopical examination of the urine; and lastly, deserves consideration in a medico legal point of view; for a death occurring as this did, in an individual, stout and presenting all the outward appearances of health, might and most probably would lead to grave suspicions to be cleared up only by a minute and microscopic examination of the kidneys. A case bearing strongly on the point and of sufficient interest and importance to be mentioned here occurred to me some time ago.

A sepoy was admitted into Garrison hospital from the detachment of the 8th Regiment N. I. on duty here, with urgent oppression at the epigastrium, dyspnœa and vomiting. He died within four hours of admission. It was satisfactorily ascertained, that he had been on duty that day from eight till ten A. M., that he had presented no symptoms of illness, and that his comrades did not consider that he was ill when relieved from sentry duty. On returning (after relief) to his lines, he complained of

sickness and vomited *once* and then began to feel a sense of constriction about the epigastrium with difficulty of breathing, great restlessness and cold sweats. He was carried to hospital. On arrival was pulseless and evidently dying, he vomited once after admission into hospital. There had been no purging, there was urgent thirst but no burning heat, or pain at the epigastrium, but only the feeling of constriction. It was clearly ascertained, that he had taken no food that day. The nature of the symptoms excluded narcotic poisoning, nor did the whole history of the case lead to the supposition that an irritant or narcotico-irritant poison had been taken, the symptoms most resembled those of the collapsed stage of cholera. On inquiry it came out that he had suffered from an acute attack of beriberi at Kolapore; that slight symptoms of the disease had shewn themselves from time to time, but that he had never been to hospital, and a number of sepoys stated in the presence of the dresser, that he was known to have beriberi, but was afraid of European treatment and would not go to hospital. An inquiry was held by the Commanding officer, and the body ordered to be kept till further instructions were given regarding the disposal of it. It was however taken away and burned; the orders having been (wilfully)? misunderstood. I gave my opinion that providing it could be clearly ascertained that he was subject to beriberi, the sudden death was consistent with the known frequent alarmingly sudden termination of that disease. It was an important question in a medico legal point of view, whether such an opinion would have been borne out by a post mortem examination; I believe that it would, and that (as in the case of Marrigadoo) effusion into the pericardium with œdema pulmonum and Bright's disease of the kidney would have been detected.

Minute and microscopic examination of the kidney be-

comes an essential point in the elucidation of the causes of sudden death in natives of India.

J. L. RANKING,
Civil Surgeon.

RAJAHMUNDRY,
1st January, 1852.

Since writing and while on the point of dispatching the foregoing report, I have received Dr. Golding Bird's last edition of "urinary deposits," in which I find that he notices and delineates the form of oxalate of lime alluded to in this report and which is considered by that eminent pathologist to be an oxalurate of lime rather than an oxalate. He also qualifies his former opinion that oxalation is not found connected with granular degeneration of the kidneys in the following words—"I have met with *but few* well marked instances of a complication of this oxalic affection with granular degeneration of the kidneys."

Although, therefore, I cannot lay claim to originality in the detection of the peculiar form of oxalate of lime of crystals alluded to, it is satisfactory to find that my observations have been corroborated by such an authority as the author named.

J. L. R.

ANEURISM OF EXTERNAL ILIAC.

Cured by Galvano Puncture.

William Hayter aged 31, Serjeant, 1st Madras Fusileers, Temperament Sanguine, Habit of body Stout. Habits, Temperate.

2d August 1852.—Transferred to the Garrison hospital, Bellary, with the following statement:—"Suffering from an Aneurismal tumor of the left external Iliac artery since December 1851, which unfits him to march with the Regiment." I was acquainted with the case, the patient having been un-

der me while in temporary charge of the Fusileers early in the year. I have not the hospital journal to refer to but recollect the circumstances at the time of admission which was a day or two before I saw him. A few days previous, he had felt an uneasy sensation in the left groin extending down the thigh, which swelled and being unable to walk, he came into hospital. The limb was then much swollen and very painful, but a pulsating tumor in the groin was not discovered till some days after.

The history of the case from that time till the 4th September may be told in few words. The tumor gradually increased till it attained the size of a fowl's egg, pulsating strongly, accompanied with a bruit which could be traced two inches above the tumor. The state of the limb varied, being more or less swollen and painful. The Serjeant's health remained remarkably good throughout the long confinement, this in part may be ascribed to the nourishing, but non-stimulant diet he was kept on. An attempt to cure by retarding the circulation above the tumor could not be efficiently adopted in such a situation, therefore, as the best means under the circumstances a well adapted Signoronis tourniquet was applied to the tumor. With this, pressure was maintained as firmly as could be borne. Whether it was due to this, or that the Aneurism remained in a quiescent state I cannot say, but month after month, no change in the state of the tumor occurred. But there was certainly no diminution of it, nor abatement of the pulsation, and the question arose, what was to be done?. In civil life (if the patient's livelihood did not depend on manual labour), doubtless the course would have been to let it alone; persistent pressure and perfect quietude might, in time, have effected a cure; but, here was a soldier in the prime of life, who for ten months had been performing no duty and whose return to it, might be long postponed. He could not be allowed to be a burden on the State, while to discharge him as ineffective was a hardship to a man in good health and after 12 years' service.

To attempt a radical cure by taking up the vessel above the sac, I did not deem justifiable, considering the serious nature of the operation, and, that his life was in no present danger from the disease.

I had met with a few cases recorded* where Galvano-puncture was successfully resorted to. It was either in Aneurism of small vessels such as the temporal, or where compression of the vessels above could be maintained, indeed the arrest of the circulation above the aneurismal sac was regarded as essential. In this case, owing to the situation, it was impossible to effect it; nevertheless I thought, under the circumstances of the case, it was warrantable to give Galvano-puncture a trial, and on the 4th September two long fine needles were introduced an inch within the sac, each being connected with the wires of a Galvano-*Magnetic* machine. The object was to avoid shocks and merely pass a current through the sac. Pressure, as firm as could be borne, was made above, but it was insufficient to stop pulsation in the tumor. The sensible effect produced was, pain in the groin, and violent agitation of the whole body. At the expiration of 20 minutes the needles were withdrawn. The tumor was pulsating as before. Strict quietude was enjoined. For three days after, neither did the Aneurismal tumor, nor his general state give indications that any effect had been produced. On the 8th it is noted "Tumor painful. Is in a nervous depressed state; cannot sleep." This condition passed off and nothing presented worthy of notice till the 12th when the tumor again became very painful and he was again in a nervous restless state. Leeches were applied to the groin and sedatives administered. As every circumstance in the case from this date to the termination of it, is interesting, I will give the prominent features from the entries made at the time in the journal.

* Ranking's Digest, Vol. iii. p. 125.
Do. Vol. iv. p. 112.
Do. Vol. vii. p. 123.

14th.—Much pain last night in the tumor. There is no change in its external appearance, but he thinks himself that it pulsates fainter than it did before. More leeches, Anodynes.

15th.—Considerable erysipelatous inflammation on and around the tumor.

16th.—Much constitutional disturbance. Inflammation has spread round the hip, pain of a burning character; thigh much swollen. Tumor pulsates. Purgatives and refrigerants ordered.

17th.—Constitutional disturbance abated and local inflammation subsided.

19th.—Is very uneasy; nervous, restless and desponding, complaining of general pains; has lost his appetite and cannot sleep, circulation quickened. The inflammation is quite gone. The tumor appears to be larger, but pulsation not so strong as before. The patient describes an uneasy sensation in the aneurism, which he traces along the course of the vessels to the heart. A bruit is heard in the tumor and along the iliac for an inch or two. Heart's impulse and sounds normal. Digitalis and morphia prescribed.

20th.—Calmer to-day.

21st.—Is returning to the condition he was in previous to the operation.

22nd.—The tumor feels harder and the pulsation fainter; the heat he says, is more in the vessel above than in the groin.

27th.—Tumor sensibly harder and pulsation fainter.

6th October.—Pulsation to-day is very faint.

8th.—Pulsation hardly to be felt.

11th.—No pulsation for the last three days: the tumor is hard and diminishing. No pulse can be heard by stethoscope for two inches above or below the sac.

20th.—No return of pulsation and the tumor is gradually

lessening; limb but little larger than the opposite one; has lost the numbness so long felt in it and only complains of want of power to walk.

It is unnecessary to continue further extracts from the journal. From the date last recorded to the present 4th January 1853, Serjeant Hayter has been making good progress in walking. The remains of the aneurismal sac feels like an enlarged inguinal gland about the size of a nut. There is œdema of the leg still.

In the cases, whose treatment by galvano—puncture led me to try it in Serjeant Hayter's, the cure was effected by a continuous current of electricity producing coagulation of the blood in the sac; one may infer this by the rapid effect, for in a case of subclavian aneurism, "The tumor was felt to be becoming gradually solidified, and before the withdrawal of the needles it had become perfectly solid and pulsation was no longer felt in it." In another case of popliteal aneurism a like rapid effect was not obtained, [attributed to the agitation of the patient] still in 24 hours pulsation ceased, and in seven days he left the hospital walking quite well. This was not the modus operandi in the Serjeant's case, but inflammation and deposit of lymph which filled up the sac. This mode is a hazardous one and was not intentionally induced. The galvanic effect was probably too violent to produce the former, though the machine, an electro-magnetic coil one, was used at its lowest power. I thought at first, too little had been done, but, when I found the external sign of the inflammation going on within the sac, accompanied by much constitutional disturbance, I began to fear that too much had been done. I watched with solicitude for the dark spot on the tumor the forerunner of sloughing. Happily the threatened danger passed away. The patient was of sound constitution, he lay in a spacious well ventilated ward, and the season was favorable; under opposite circumstances the event might not have been so propitious. Not-

withstanding the radical cure effected in this case, I should reluctantly resort to it again for aneurism of the external iliac, unless, I had the electric power under command;* but still, a successful case by such means may not be without its value in the records of Surgery.

E. W. EYRE,
Garrison Surgeon.

BELLARY,
5th January, 1853.

REPORT ON TREATMENT OF FEVER.

BY ASSISTANT SURGEON C. TIMINS, F. R. C. S.

The very great prevalence of Fevers in the climate of India, more especially among the native troops who constitute the chief numerical strength of our armies, and amongst whom this class of diseases forms from 30 to 50 per cent. of the total sickness, demands for them independent of their frequently fatal and intractable character, the most earnest attention of medical officers as to their nature and causes, and the modes of treatment which have proved most effectual.

I therefore trust the observations I have now to offer respecting a mode of treatment I have found successful, based as they are on extensive data and an experience of a year and half, may claim the consideration of the Medical Board and the service generally.

2. This method of treatment I was led to make trial of with a view to devising some efficient substitute for the very expensive drugs "Bark and Quinine," at present almost exclusively employed in the treatment of this most numerous class of diseases, and which remedies are daily becoming scarcer and more costly, while their employ-

* A continuous uninterrupted current is difficultly obtained from the ordinary coil machine. Would not the hydro-electric chain be well adapted to the purpose ?

ment is at the same time on the increase; I trust therefore it will be distinctly understood, I do not bring forward this remedy with any view of vaunting its superior efficacy, or of superseding altogether the use of that incomparable Antiperiodic, Quinine, which I believe to be still unequalled in its power of combating almost every form of fever. But it was simply as an economical substitute for the latter that I have employed it, and having found it successful beyond my most sanguine anticipations, I feel authorised in calling attention to it, as from the experience I have had of it I cannot but consider that its general adoption would be attended with advantage to the public service.

3. Though the conclusions I have arrived at respecting this method of treatment are based on facts rather than theory, and though I am desirous to refer to the results of experience rather than supporting views by laboured arguments or hypothetical assumptions, which in medical science too often lead astray and prove but ignes fatui, it is proper that I should state briefly the therapeutical considerations which suggested it. This was the very close similarity in the modus operandi of vegetable astringents and the principal Antiperiodic medicines, bark, quinine, arsenic, and analogous remedies.

With respect to this latter class of medicines, though some medical authorities seem to consider the action of tonics and antiperiodics as wholly distinct, I must express my conviction that these remedies act in precisely the same manner in checking periodic action as they do in restoring the bodily strength, that is by exerting a *tonic influence on the general system.*

The symptoms attending fevers, affording evidence of diminished energy of the nervous system, it is reasonable to conclude that these remedies cure fever by restoring tone and vigour to the system.

It would be needless, even if the limits of this report permitted it, to discuss the various forms of fever, or the views of Doctors Billing and Dundas as to the *unity* of fever, but the success attending the treatment of various types, even typhus, with quinine, bears out I think the view expressed above, that fever is cured by a tonic influence exerted on the nervous system. The action of vegetable astringents is so analogous to that of simple tonics that I must consider any difference to be one of degree chiefly, and I am clearly of opinion that many astringents would possess a good reputation as tonics and antiperiodics were they not still more remarkable for another property they possess, that of checking morbid discharges and hœmorrhages. The action exerted by vegetable astringents and tonics when taken into the stomach I consider to consist in, firstly, a direct impression on the gastric nerves producing increased contractility of the fibrous structures, and diminished action of the secreting organs supplied by them, thus giving tone to the digestive organs; secondly, this impression is rapidly extended by sympathy, exerting a tonic influence on the system at large. This action being there is reason to believe, further extended by absorption of the remedy into the circulation.

4. Seeing reason to conclude therefore that the class of astringents would prove to possess considerable antiperiodic powers, I determined to make trial of that powerful astringent *galls,* in combination with *infusion* of *chyretta,* the latter being designed to assist by its purely tonic influence the action of the galls. But though I have hitherto usually given it in combination with chyretta, I see no objection to employing it alone, as has been successfully practised in a trial of it in some cases of obstinate quartans by another medical officer. For in this combination I consider the Tannin of the galls to be the chief remedial agent, and regard it as exercising

a true tonic influence on the digestive organs and general system. And were pure Tannin employed in place of the galls, it would probably exhibit superior powers to the crude vegetable astringent, at the same time that it would be more manageable. Since the commencement of this plan of treatment, my views have derived confirmation from observing in the British Foreign Medico Chirurgical Review, that the *Tannate of Quinine* had lately been suggested and employed successfully in the treatment of intermittent fever in France.

The dose of this remedy I have generally employed has been Pulv. gallae grs. x.—xii—in infusion of chyretta one ounce to one and a half ounce, though this dose may be increased, and the frequency of its administration varied according to the nature of the case; my usual plan being to give it hourly for several hours preceding the time of expected paroxysm, a purgative being given at the commencement of the treatment, and sometimes an emetic when not contra-indicated. The galls may be given either in powder or in infusion; but though the last edition of the pharmocopœia Lond. directs I observe a *decoction of galls,* I fear the tannin would be destroyed by exposure to the temperature of boiling, I have therefore directed the Pulv. gallae to be added to the infusion of chyretta when the latter has cooled down to about 180° F.

5. During the twelve months from 1st October 1851, to 30th September 1852, the whole of the cases of fever, with one or two exceptions, in the hospital of the Bhopal Contingent, were submitted to this treatment, and all yielded to it with the exception of three cases of quartan fever which had all been neglected for three or four months previous to admission, in which I was compelled to have recourse to various remedial measures to effect a cure; and one of remittent, and one of continued fever, in which the concomitant symptoms being severe I was

necessitated to employ other remedies. The subjoined abstract exhibits the numbers treated of each type of fever, and the results.

	Febris Quotidiana Int.	,, Tertiana ,,	,, Quartana ,,	,, Remittens.	,, Continua.	Total.	Cured.
Treated by Galls and Chyretta, - - - - - - -	211	28	2	3	0	244	244
Treated by Quinine and other means, - - - - - - - -	0	0	3	1	1	5	5

With respect to the comparative facility with which this remedy effected a cure, the ordinary cases appeared to me to yield as readily to it as to most of the antiperiodic remedies I have employed, there being seldom more than one or two recurrences of the febrile paroxysm after the commencement of the treatment except in long neglected cases. But as any mere opinion as to the time occupied in effecting a cure by this and other remedies unsupported by positive facts would be little better than surmise, and wholly untrustworthy in estimating the merits of this plan of treatment, I have, with a view to determine this point, ascertained from the register of sick, the average time passed in hospital, of the cases treated by bark and quinine, during the three months previous to commencing my treatment; and that of the cases treated during the three corresponding months of 1852, by the galls and chyretta; and the subjoined tabulated statement exhibits a comparison of the time occupied under each plan of treatment, and I have been gratified by finding that the average time, (8.95 days), pass-

ed in hospital by the cases under my plan of treatment, is less than that of the cases treated by quinine, the average of which is 9.91 days.

	Cases treated by Quinine, &c.			Treated by Galls and Chyretta.		
	Number of cases treated.	Total days in Hospital.	Average number of days of each case in Hospital.	1852. Number of cases treated.	Total days in Hospital.	Average number of days of each case in Hospital.
1851. July,	24	198	8.25	15	122	8.13
August,	49	531	10.83	23	198	8.60
September,	60	590	9.83	35	334	9.54
Totals and averages,	133	1319	9.91	73	654	8.95

6. Having then experienced the utility of the galls during a trial of twelve months, I determined to test that of another powerful astringent, *Catechu*, which from the large quantity of tannin it contains, amounting to nearly 50 per cent., I considered should prove equally efficient. Accordingly since the 1st October 1852 to the present date, this astringent in combination with infus. chyretta has been indiscriminately employed in all the fever cases admitted, and I am happy to say has proved as successful as the galls. The dose employed has been the same as that of the galls; in only two cases did I have recourse to quinine. The following is an abstract of the cases treated from 1st October 1852, to 31st March 1853, numbering 175.

	Febris Quotid. Int.	„ Tert. „	„ Quart. „	Total.	Discharged. Cured.	Remaining.	Remarks.
Treated by Catechu and Chyretta, - - - -	159	8	6	173	169	2	Two cases died suddenly from Apoplexy after the Fever had been checked.
Treated by Quinine, &c.	2	0	0	2	2	0	

Among these cases two deaths occurred from a remarkable epidemic of apoplexy which carried off five men of the contingent within a few weeks, and respecting which it is only necessary to remark here that these two cases can properly have no bearing upon the results of the treatment under consideration, especially as the fever had been checked previous to the sudden invasion of the apoplectic symptoms, which were of a peculiar character, and proved fatal in a few hours.

7. From the above abstracts of the cases treated both by catechu and by galls, it will be seen that of 424 fever cases admitted into hospital from 1st October 1851, to 31st March 1853, 415 have been cured by this system of treatment; and that in only seven cases have I found it necessary to have recourse to other remedies, and of these latter cases some were complicated with local disorder and necessarily demanded other measures in addition to antiperiodic treatment.

In addition to the above cases occurring in the Bhopal contingent, a very much larger number of charity patients have been similarly treated in the Agency Hospital, but I need hardly observe it is impossible to determine accurately the results of treatment among this class of patients from their irregular attendance, though there is no reason to doubt

that the remedy proved equally useful in these cases; indeed had it not been for this economical mode of treatment, I could not have supplied the extensive demand for antiperiodic medicines, among about 2000 cases of sickness of all kinds, who applied to me for medical aid during the past year, and for whom there is no hospital or dispensary provided here. That there might remain no doubt as to the correct administration of the remedy, I have taken the precautions to supply it myself to the hospital, and have also removed the quinine from the custody of the native doctors allowing them only a small quantity when required for other cases.

Dr. Steel, my immediate superior, who is Superintending Surgeon of the Gwalior contingent and Malwa, and was informed by me of the investigation I was carrying on, caused it to be tried in some of the hospitals under his superintendence, and I am happy to say that after a careful trial of it, he has reported very favourably of it. In a letter received from him some months back, he observes—"your theory of the action of the gall-nuts I consider "sound, the numerous facts are sufficient to convince all "reasonable men of the utility of the gall-nut in the "treatment of Indian intermittents, as generally met with "in our native hospitals, and in my opinion sufficient "to introduce the treatment into general practice."—and in forwarding recently to the Medical Board, Calcutta, a second letter from myself on the subject, he remarks in his transmitting letter—"I have still reason to think favour-"ably of the gall-nuts as an antiperiodic. Of late it has "been used in the Gwalior hospitals with decided be-"nefit; a short time since I had an opportunity of seeing "a few cases of obstinate quartans treated on this plan, "and of perusing the original diaries of these cases, kept "by Mr. P. O'Brien of the 4th Infantry S. C., with great "care and fidelity, and I am happy to say that the

"result was all that could have been expected. He used "the gall-nuts alone without chyretta, in 30 or 40 grain "doses, three or four times daily on the days of the expected "paroxysm, and somewhat less freely on the intermediate "days. The medicine does not appear to have an astrin-"gent effect on the bowels, constipation consequent on "its use has not been observed."—I may also observe that the Calcutta Medical Board have directed a trial of it in the hospitals throughout the Bengal Presidency.

8. I can have no doubt there are other vegetable astringents that would prove useful as antiperiodics, particularly *Kino*, of which I may perhaps make trial. Though I consider the galls and catechu the most powerful, and at present I give the preference to catechu as being not only efficient, but also more easy of administration from its solubility, at the same time that it is considerably cheaper than the galls. Both these medicines are, I believe, abundant in almost every bazaar in India; galls under the native name *Majoo Phul* are readily procurable in this place for about one rupee a seer of 80 rupees weight. Catechu or *Kutta* from three to four annas per seer, and chyretta *twelve annas to one rupee per seer*—and the average expenditure for these drugs in my hospital has not exceeded one rupee a month during the time they have been employed in curing the above cases of fever. Wholesale they might, no doubt, be procured very much cheaper, and of better quality. I mention these details, as the chief ground on which I recommend the employment of these remedies is that of economy in the public service; my annual indent for medicines for the present year lately sent in, affords perhaps the simplest demonstration of the advantages of this treatment as far as economy is concerned, for in consequence of the substitution of these cheap astringents in place of bark and quinine there remains

so much of these latter drugs in store as to render it unnecessary to indent for any, and I hope by continuing this system to afford still further proof of its utility.

9. I will now proceed to notice what may be theoretically objected to these remedies, and which it occurred to myself at first might prove an impediment to their employment as antiperiodics, namely, that their astringent property would tend to produce constipation. I am happy to say experience has completely removed this fear, as I have never during the whole time that I have employed these medicines found any inconvenience, or valid objection to their use from this effect, though I have been careful to inquire for such. I have not noticed any greater tendency to constipation under this treatment than is ordinarily the result of that atonic dyspeptic condition of the digestive organs attending intermittent fever. And it should be borne in mind that the modus operandi of vegetable astringents on the living organism is not a mere physical or chemical action, obeying the laws of dead matter, but a true vital action resulting from the impression on the nerves, which action is therefore influenced and modified by the vital powers, so that though astringents exert through the nervous system a counteracting remedial influence over a state of disease, it by no means necessarily follows that the influence would extend and continue beyond the restoration of the normal condition; for the action of the astringent would then be opposed by the natural laws which tend to maintain the normal condition of the system, and combat the tendency to disorder while they facilitate the health restoring action. This view is in accordance with the observations of Dr. Pemberton who in his work on Abdominal diseases remarks regarding Kino—" In this drug you have a medicine which exerts " its power to restrain the discharge of the glands when

"they are secreting too much, without exerting any such "powers on the glands when they are acting naturally." And he also is of opinion "that it contracts a vessel too "much relaxed to its natural standard, but that it is "unable to contract it any further." I may also refer to the observation of Dr. Steel quoted above that constipation has not been noticed to attend the employment of these astringents.

10. This mode of treatment then is not based on mere theoretical views, or the results of a few garbled cases, but on the only reliable foundation of medical practice, an extended experience of it in 415 cases of fever during a period of 18 months—and not till I had before me abundant evidence to demonstrate satisfactorily its utility, have I ventured to call attention to it. For it is only by the severe principles of induction from sufficient data that correct conclusions can be attained in therapeutical as in any other science; and it is this mode of proceeding which can alone place medicine in its proper rank among the exact sciences. I therefore refer simply to the numerical statement of cases in proof of the utility of this treatment, abstaining altogether from forwarding individual cases, considering them, however well adapted by their specious appearance to prop a theory, as worse than useless in determining the general efficacy of any plan of treatment. I have endeavoured from the commencement of my investigations to estimate this treatment without prejudice, and to give a candid, unvarnished statement of the results, neither exaggerating its efficacy or extenuating any disadvantages that might attend its employment; and my convictions of its utility and advantages have been the result of the great and unlooked for success attending its use during an extended period.

I submit then, that the statistical evidence adduced of

the results of this mode of treatment, demonstrates that the ordinary fevers of this country may be cured in the very large majority of cases without having recourse to bark or quinine; and secondly, that the cases cured by this method, as shown by the table at page 9, do not occupy a longer time in treatment than those cured by quinine and bark; and I must express my conviction, which each day's experience only tends to confirm, that were its employment generally adopted, with the aid of the liquor arsenicalis in obstinate cases, the consumption of bark and quinine in the hospitals in this country, might be reduced to a very small amount, and an important reduction effected in the cost incurred by Government for these very expensive drugs.

CHARLES TIMINS, F. R. C. S.

SEHORE, BHOPAL, 6*th April*, 1853.

Assistant Surgeon,
Bhopal Contingent's Agency.

No. 147.

SUPERINTENDING SURGEON'S OFFICE, W. D.
BANGALORE, 1*st October*, 1853.

To

The Secretary to the
Medical Board.

SIR,

With reference to the Medical Board's letter* No. 560, I have the honor to forward reports from the medical† officers in charge of native hospitals in this Division, by whom the indigenus astringents and tonics (recommended, by assistant surgeon Timins) in the treatment of the ordinary fevers of the country have been subjected to trial,

* Dated 27th April 1853.

† Surg. C. Kivin, 44th Reg. N. I.
,, J. Supple, 12th ,, ,,
,, J. Williams, 4th ,, ,,
Asst. Surg. C. W. Duff, M. D. P. C. Depôt.
,, J. R. Theobalds, 21st Reg. N. I.

and to acquaint you, for the Board's information, that these reports include all the corps and departments in this range, in which fever has prevailed to any considerable extent, during the current year. The 31st Regiment L. I. at Hurryhur, and 1st Regiment L. C. at this station, have both been particularly healthy, and the cases of fever so few as to afford scarcely any opportunity of testing the new mode of treatment.

The following is a brief summary of the results of the reports.

Surgeon Kevin exhibited the vegetable astringents, in scruple doses, in eight cases of quotidian intermittent fever. In two of the cases, the disease did not yield to the remedy, and in one of them, it became of a continued form, when the astringents were discontinued, and Quinine and other remedies resorted to. The remaining six cases being of a mild form, were cured. The largest quantity of astringents exhibited in any one case, having been 350 grains, the smallest 100 grains, and the average in the six cases, 188 grains.

Surgeon Supple reports that astringents were given in 19 cases of fever, viz. one remittent, one tertian intermittent and 17 intermittents, (Quotidian being probably meant); of these, nine cases were treated by his predecessor, in charge of the 12th regiment, assistant surgeon Theobalds, and ten by himself. The remedy, he observes, was found to have little or no influence in curing the fevers met with at the French Rocks, which are generally of an obstinate character, and after some days unsuccessful trial, he was obliged to resort to the use of Quinine.

Surgeon Williams employed the astringents in 15 cases of quotidian, and one of tertian intermittent fever, of these, six were cured, and the remaining ten, are entered as being relieved, and were subsequently cured by

other means. Mr. Williams is of opinion that the astringent mode of treatment, will be found to fail in the fevers occurring at elevated stations like Mercara, whatever effect it may have, in milder and less variable climates.

Dr. Duff P. C. Depôt reports that he treated about fifty cases of fever, with astringents, and with considerable success. In a few cases, those of long standing, the medicines produced uneasiness of stomach, with purging of slime and blood. Astringents were most successful, he remarks, in recent (and I presume uncomplicated) attacks of fever. The effects of the treatment he considers, to be less speedy than with Quinine, about five days being required to check a fever with astringents, which would yield to Quinine in three days, nor did the remedy, it is stated, cut short the paroxysm, in any one instance. Doctor Duff considers, the proposal for treating fever with astringents, as a valuable suggestion, in so far, as the remedy is easily procured in every part of the country, and its cost moderate, as compared with other anterperiodic medicines.

Assistant surgeon Theobalds, in addition to the nine cases adverted to in Mr. Supple's report, treated eleven cases with astringents in the hospital of the 21st regiment N. I. In two of these, he was obliged to resort to Quinine, and a third only yielded on the tenth day, and after 640 grains had been taken in scruple doses. The remaining cases were cured. The largest quantity, of astringents exhibited was 640 grains, (as above stated) the smallest 120 grains, and the average in nine cases cured, 285 grains.

In conclusion, as the result of my own observation, having seen nearly all the cases of fever treated at this station, I may in the first place observe, for the information of the Board, that the medical officers appear to have but little confidence in the remedy, and in

severe cases, were indisposed to rely on so uncertain a mode of treatment; I did not therefore object to their giving it up, and employing other remedies, when any danger was to be apprehended, and in the next place, I may state, that my own conviction is, the cases of fever which could be cured by vegetable astringents, are only those of a mild form, and such as would yield to an emetic and purgative, followed by a few doses of any ordinary tonic.

I have the honor to be,
Sir,
Your most obedient Servant,
GEO. PEARSE, M. D.
Superintending Surgeon, Mysore Division.

REPORT OF ASSISTANT SURGEON C. M. DUFF, M. D., ON, THE TREATMENT OF FEVER BY VEGETABLE ASTRINGENTS AT THE PUBLIC CATTLE DEPOT, HOONSOOR.

About 50 cases of intermittent fever in natives, admitted into this hospital have been treated by vegetable astringents in the manner recommended by Dr. Timins, and I am happy to say with very considerable success.

In every case on admission the usual preliminary treatment by emetics and purgatives was pursued; when the tongue became clean and nothing further was wanted but to break in upon the periodicity of the paroxysms the mixture of galls and chyretta was given as directed.

In a few of the first cases tried, it was found that very considerable uneasiness of stomach and pain of the bowels and even severe purging and passing of blood and slime were produced by the medicine, which however after a short time went off, till the next dose was given. On looking into those cases which exhibited these symptoms in the most marked degree, it was found that they were generally cases in which the

disease was of long standing and in which there was some organic enlargement of the spleen.

On noticing that cases so affected made no improvement under this treatment they were subsequently exempted from it altogether, and Quinine and other remedies substituted.

The cases in which the astringent mode of cure was employed with the most marked success, were those in which the disease was then present for the first time or of very recent origin in the system: in men of robust frame little weakened by the disease, and exhibiting no traces of enlargement of spleen or other viscera.

It was remarked that this treatment by astringents, cœteris paribus, was not so speedy in arresting the paroxysm as that by Quinine—nor was the fever in a single case ever cut short after one day's administration of the medicine, as is so markedly noticed, frequently after properly timed doses of Quinine.

The average time required to arrest the periodic tendency of the paroxysm of fever in all of the above 50 cases, was about five days; with Quinine three days sufficed; for, on account of the disagreeable symptoms produced in weaker subjects, by this plan of treatment, as above stated, the two modes of cure were pursued at the same time in Hospital and gave the above results. Of course by both methods, the medicines were continued to be given some days after the paroxysms disappeared, in order to insure their full effects on the system; after which that valuable tonic the persesquinitrate of iron was given alone.

As there appeared to be nothing worthy of note in the cases treated by astringents in this hospital, further than has been stated above, I have merely to record the very favourable opinion I entertain of this mode of treating cases of fever, and were it only from the fact that the remedies employed are so easily ob-

tained and that at prices so very moderate compared with other ante-periodic medicines, this plan of treatment must be considered a very valuable additional means of cure, and, with discrimination, well worthy the adoption of the profession generally in this country.

Hoonsoor, 27*th September*, 1853. } C. MURRAY DUFF, M. D. *Assistant Surgeon, P. C. D.*

To

The Superintending Surgeon,
Mysore Division,
Bangalore.

Sir,

I have the honor to acknowledge the receipt of your Circular Memorandum, No. 139, of date the 12th September, 1853, relative to reports on cases of fever treated by vegetable astringents, and in reply beg to state that the original Circular in connection therewith was received during my absence on sick certificate, and on my return I found the above named treatment was being tested by the medical officer in charge to the extent of nine patients, *i. e.* one remittent, one tertian, and seven intermittent cases, with whom it was omitted after a persistance of eight days continuance, and Quinine was necessitated to be resorted to, prior to a recovery being effected. I exhibited the galls in combination with infusion of chyretta, in ten cases of fever of an intermittent type, and finding after some days experience with it that it appeared to exercise little or no influence on them (which it will be observed are generally of a most obstinate character here) desisted from its use, and employed the more generally ameliorative course of Quinine.

I have the honor to be, &c.

French Rocks, 16*th September*, 1853. } JAMES SUPPLE, *Surgeon.*

Return of Cases of Intermittent Fever treated by Galls with Infusion of Chyretta.

NAMES.	Age.	Diseases.	Days under Treatment.	Days of Fever.	Quantity with dose of Galls taken.	REMARKS.
Shekh Murtoom,	34	Febris Quot. Intermittent.	Seventeen	Five	120 grains in doses of ten grains.	A severe attack cured by Quinine after taking Galls and Chyretta for two days without the least apparent benefit.
Yellapauh,	35	do. do. do.	Twenty	Six	60 grains in doses of ten grains.	Type changed to common continued fever on second day and the Galls and Chyretta discontinued in consequence.
Braham Deen,	37	do. do. do.	Ten days	Seven	350 grains in doses of ten grains.	Cured.
Runga Row,	19	do. do. do.	Ten days	Six	300 grains in doses of ten grains.	Cured.
Mahomed Eluaham,	20	do. do. do.	Three days	Two	100 grains in doses of ten grains.	Cured.
Ramiah,	31	do. do. do.	Four days	Two	100 grains in doses of ten grains.	Cured.
Shekh Davood,	21	do. do. do.	Seven days	Three	180 grains in doses of ten grains.	Cured.
Timaraphu,	21	do. do. do.	Three days	One	100 grains in doses of ten grains.	Cured.

BANGALORE,
14*th September*, 1853.

C. KEVIN,
Surgeon, 44th Regiment, Native Infantry.

Return of Cases of Intermittent Fever treated with Galls and Infusion of Chyretta.

NAMES.	Disease.	Days under Treatment.	Days of Fever.	Quantity with dose of Galls taken.	REMARKS.
Vurthiah,	Febris Quo. Int.	Six	Two	150 grs. in Scruple doses.	Cured.
Croopoosingh,	do.	Seventeen	Four	120 grs. in Scruple doses.	Took also Bark and Acid, Cured.
Gooriah,	do.	Six	Two	300 grs. in Scruple doses.	Cured.
Cassamah,	do.	Two	One	120 grs. in Scruple doses.	Cured.
Lutchmena,	do.	Six	Two	240 grs. in Scruple doses.	Cured.
Gooriah,	do.	Fifteen	Eight	420 grs. in Scruple doses.	Cured.
Yerriah,	do.	do.	Six	340 grs. in Scruple doses.	Cured.
Neeliah,	do.	Twenty	Seven	60 grs. in Scruple doses.	Took Quinine on the 8th day in half grain doses which checked Fever.
Lutchmiah,	do.	Ten	Four	240 grs in Scruple doses.	Took Quinine in two grain doses on the 5th day the Gall mixture was given again on the 6th day but Fever returned after it had been checked by Quinine.
Nursanah,	do.	Fourteen	Nine	640 grs. in Scruple doses.	Took Galls 3d day after admission to the 9th day, but had Fever daily up to the 10th day. Cured.
Shaik Daoud	do.	Eight	Five	240 grs. in Scruple doses.	Cured.

The above cases took on admission an emetic followed by purgative a few hours after, and saline medicines while fever was present.

Bangalore,
12*th September*, 1853.

J. R. THEOBALDS,
Assistant Surgeon, 21*st Regiment, N. I.*

A Report of Fever Cases treated by Chyretta and Galls from 16th May to 26th September 1853.

DISEASES.	Admitted.	Total.	Relieved.	Cured.	Cured by other means.	Discharged.	Remarks.
Feb. Quo. Inter.	16th May 1853	1	29th May 1853	....	1	16th June 1853	
do.	18th do.	1	30th do.	....	1	20th do.	
do.	18th do.	1	....	25th May 1853			
do.	23rd do.	1	8th June do.	....	1	11th do. do.	
do.	24th do.	1	....	29th May do			
do.	26th do.	1	....	5th June do.			
do.	17th June do.	1	....	15th July do.			
do. Tert. Inter.	18th do.	1	2nd do. do.	....	1	15th July do.	
do. Quo. Inter.	7th July do.	1	....	15th July do			
do.	7th do.	1	13th July do.	....	1	27th do. do.	
do.	10th do.	1	....	18th July do.			
do.	12th do.	1	27th do. do.	....	1	12th Aug. do.	
do.	13th do.	1	27th do.	....	1	5th do	
do.	13th do.	1	27th do.	....	1	5th do.	
do.	27th do.	1	31st do	....	1	8th do.	
do.	10th Aug. do.	1	20th Aug. do.	....	1	5th Sept. do.	
Total...	16	16	10	6	10	10	

The plan of treatment advocated by Dr. Timins and ordered to be tested by the Medical Board, has been carefully carried out here and the result as shewn in the above table is decidedly unfavourable; whatever good effect it may have on a large scale in milder and less variable climates than Mercara during the monsoon, I am of opinion that in the majority of cases of ordinary fever occurring at elevated stations it will fail.

MERCARA,
27th September, 1853.

JOS. WILLIAMS,
Surgeon, 4th Regiment, N. I.

Memo. of Fever Cases treated with Infus. Chyretta and Pulv. Gallæ, also with Infus. Chyretta and Pulv. Catechu, in 25th Regiment, N. I.

Number.	NAMES.	Catechu.	Gallæ Nut.	Date of Admission.	Date of Discharge.	Diseases.	REMARKS.
1	Pt. Soobboyah,	...	1	18th May 1853	29th May 1853	Feb.Quot.Int.	
2	Pt. Chellacoottee,	...	1	19th do.	24th do.	do.	
3	Drummer Duff,	...	1	21st do.	25th do.	do.	
4	Pt. Curpenah,	1	...	9th July do	13th July do.	do.	
5	Pt. Gungiah,	1	...	7th do.	20th do.	do.	
6	Pt. Shaik Homed,	1	...	14th do.	20th do.	do.	
7	Pt. Audevaraidoo,	1	...	15th do.	25th do.	do.	
8	Pt. Curpenah,	1	...	17th do.	25th do.	do.	
9	Pt. Shaik Bram,	1	...	23d do.	28th do.	do.	
10	Naigue Coopsing,	1	...	26th Aug. do.	1st Sept. do.	do.	
11	Pt. Abdul Khoder,	1	...	30th do.	....	do.	7th Sep. Died
12	Pt. Shaik Rustoom,	1	...	5th Sept. do.	25th do.	do.	

1st 12 days in Hospital, got well with Medicine.

2d 6 days do. do.

3d 5 days do. do.

4th 5 days do. do.

5th Had fever for four days previous to admission; on the seventh day after admission I was obliged to give ten grains of Quinine every three hours before fever was expeeted. First dose put a stop to the fever, but I continued three doses daily, four days longer and on the 5th he was discharged free from disease.

6th 20th. Got well.

7th 9 days do.

8th 8 days do.

9th 6 days in Hospital, got well.

10th 6 days do. do.

11th, On admission and for some time previous he had two attacks daily of fever, the medieine on the 4th day after admission put a stop to the 2d attack, but he continued to have one attaek daily for two days more, and as the last one was very severe I omitted the cate-

chu and gave three--ten grains doses of Quinine during the day, before the attack was expected. He became much weaker next day, and took together with Quinine diffusible stimulants of ammonia and camphor, and had mustard sinapisms applied to the calves of the legs. Afterwards brandy and ammonia were ordered, and a blister to the nape of the neck, but he sunk about noon.

12th was in hospital for twenty days, and up to the 6th, he got fever daily, the 7th he escaped, but again on the 8th, it returned, and also on the 9th and on the 10th after admission, he took Quinine (three doses of ten grains each). The next day he had fever, but it was much milder, and which returned slightly for the next three days, after that he had no fever.

From the foregoing I am inclined to think that, in cases of rather obstinate character, the catechu and chyretta are medicines not to be depended upon, and as regards the gall powder I can only say that, the three cases treated with it, were of so mild a nature, that I think they would have got well without any medicine.

KURNOOL,
21st October, 1853. } M. SIMPSON,
Assistant Surgeon,
25th Regiment, N. I.

To

The Superintending Surgeon,
Nagpore Subsidiary Force.

SIR,

In reply to your Circular Memo. No. 10, I have the honor to report that I have made extensive trial of the Powder of Galls, in infusion of Cheyretta, as recommended by assistant surgeon Timins for the cure of Intermittent Fever, but have failed to observe any marked effects resulting from

its use in any single instance. Much to the disgust of my patients who are well acquainted with the virtues of Quinine, they have consumed nearly one and a half pound of galls and a few ounces of Catechu. The powder was given to the extent of a drachm in 10 grain doses daily, but subsequently in scruple doses. In no case did it exhibit an antiperiodic property; for although in some slight cases of the quotidian type, the paroxysms, in 3, 4, or 5 days diminished in duration and severity and eventually ceased, the cure in those instances was to be attributed rather to the evacuation of the stomach and bowels in the first place, and to the subsequent gentle action kept up on the latter and on the skin by saline medicine, also to restriction to hospital, and to the tendency of ague to gradually wear itself out. In the majority of the cases in which I used galls, recourse to Quinine was necessary.

I have the honor to be,
Sir,
Your most obedient Servant,
H. GOODALL, Surgeon,
6th Light Cavalry.

Kamptee,
11th February, 1854.

To
The Superintending Surgeon,
Nagpore Subsidiary Force.

Sir,

In obedience to instructions contained in letter from Secretary Medical Board to your address, No. 560, dated 27th April 1853, annexing extract from a report on the treatment of the ordinary fevers of this country, with indigenous astringents and torics by assistant surgeon Timins; I have the honor to report that I have tried Galls as therein recommended in about forty cases of intermittent fever at the civil dispensary of this station, and am sorry to say that the result has proved unfavorable, not sustaining the high

anti-periodic character given to that medicine. Twenty-four of the cases treated were in-patients of the dispensary, chiefly travellers who had contracted fever in the surrounding jungles, none of whom were cured; quinine or arsenic had to be resorted to in the end; the remaining cases, were all out-patients, and of them only three are said to have derived any thing like decided benefit.

I may state that the exhibition of Gall powder when retained upon the stomach seemed often to put back, for an hour or two, the usual paroxysmal period, but vomiting and griping are apt to be induced by the first doses, and its general effect has been in my hands altogether unsatisfactory.

I have the honor to be,

Sir,

Your most obedient Servant,

KAMPTEE, 31*st January*, 1854. — J. DORWARD, SURGEON, *Artillery N. S. Force.*

REPORT ON THE USE OF GALLS, IN INTERMITTENT FEVERS, AS TRIED IN THE HOSPITAL, 37TH REGIMENT "GRENADIERS."

Since the 16th May 1853, eleven cases of intermittent fevers treated in the manner, as laid down in the Board's Circular No. 560 of the 27th April 1853, and from the very limited quantity of galls in hospital stores, an opportunity was not afforded of trying its efficacy, on a more extended scale. Of the eleven cases of quotidian intermittent fever, above alluded to, eight were failures, while in three only after a trial of three or four days, did it effectually check the recurrence of the usual paroxysm. In these cases it is presumed, that the rest, and regular life in hospital, did as much towards the cure, as the remedy employed. In nearly all of the cases, its administration produced considerable irritability of stomach, which had to be quelled by effervescing draughts, and intermitting its use for the time; and in those only whose stomach retained

all the doses of the medicine, did it appear to push back as it were, the usual anticipated hour of attack, and subsequently arrested it altogether, while in the majority of cases its administration had to be superseded, by the more active antiperiodics that we possess, namely arsenic and quinine.

D. MACFARLANE, M. D.

KAMPTEE, 30*th January,* 1854. *Assistant Surgeon, 37th Regiment Grenadiers.*

To

The Superintending Surgeon,
Nagpore Subsidiary Force.

SIR,

In reply to your Memorandum No. 10, in reference to Circular No. 560, dated 27th April 1853, from the Medical Board, I have the honor to inform you, that I have treated 25 cases of fever, 21 quotidians and 4 tertians, agreeably to Dr. Timins' experiments with infusion of chyretta and powdered galls for a certain number of consecutive hours (usually from four to six) before the expected paroxysms, having previously cleared out the bowels, by a purgative, with the following results.

Number of attacks which followed after commencing the use of the infusion of chyretta and galls.

Quotidians.

4 Cases,	None.
6 ,,	One.
3 ,,	Two.
2 ,,	Three.
2 ,,	Four.
1 ,,	Five.
1 ,,	Six.
1 ,,	Seven.
1 ,,	Nine.

Tertians.

1	Case,	................None.
1	,,	................One.
1	,,	................Two.
1	,,	................Four.

I have the honor to be,

EDW. DIXON,

Assistant Surgeon,
1st Regiment N. I.

KAMPTEE,
10*th February,* 1854.

Before prescribing a medicine and assigning it any special curative property we require to mark not only the symptoms present at the time of giving it; but also carefully to note their antecedents; in other words, to inquire what have been the illness causes; if not, we shall fall into the error of attributing to a nauseous drug or harmless ptisan what is nothing more than a removal of the previous disease producing conditions permitting nature unaided to do her work.

The above is a trite and common observation yet one too frequently overlooked, hence leading to that post hoc propter hoc mode of reasoning, which in medicine as elsewhere, has done so much harm, impeding our knowledge of the real nature of various remedies, preventing our assigning them their true position in the order of their curative properties, and by causing doubt and confusion in our own ranks has shaken public confidence in legitimate practice and unjustly placed the professors of physic and of law in the same category as followers of glorious uncertainties.

Bearing in mind the above remark let us enquire what are the causes of fever amongst the sepoys at this station. I believe the true answer will be found in two words, "heavy duty," and the consequences it inevitably

entails, viz. insufficient rest, prolonged exposure to atmospheric vicissitudes especially at night and subsequent fatigue. In thus narrowing the ground I may be told that I have taken too contracted a view, and have fallen into the very error I condemn, I would reply *more Scotico* by asking a question. Why are the men exposed to the various influences noted and which doubtless are the active agents in producing sickness? as the answer will be found in the work to be done, it is there the shoe pinches; lessen that, and the other causes would be materially modified, comparatively powerless. This I think is corroborated by contrasting the admissions from fever amongst the lascars of the ordnance department and the sepoys of the line regiment; the former are few compared to the latter, the solution in my opinion must be sought in the different nature of their employment; in the one admitting of sufficient rest with slight exposure especially at night, in the other the reverse; the duties of the first being chiefly confined to the Arsenal with one line night guard once in ten days, while those of the last consist of sentry work so onerous as barely to permit of their relief.

What is the consequence, sooner or later the whole body is out of sorts, the cutaneous and nervous systems, the circulating and secreting organs begin to sympathize, the rest is disturbed and unrefreshing, the manner listless and irritable, the circulation languid, the appetite and strength impaired, the bowels constipated, the urine loaded; and thus not well, and yet not ill enough, or, unwilling it may be, to report sick, a man goes on from day to day in periods (varying according to individual temperament, resistance, power, or other causes) from two to five, a week to ten days until at length another tour of duty, it may be a dose of that inexplicable poison malaria or both combined, gives him the *coup d'grace*,

and forces him to apply for medical aid. Reverse the proceedings, take him into hospital where he is at rest sheltered from the pelting storm, the scorching heat, that alternate burning and chilling blast and in slight cases, this alone will afford relief; unite to the above an emetic to rouse the torpid and oppressed organs, a purgative or purgatives (as may be required) to unload the costive bowels, carry off the vitiated secretions and so restore the healthy functions of the chylopoetic viscera and these will frequently suffice; while in others where the appetite and strength do not return and the fever still recurs, a vegetable bitter will usually complete the cure. If the foregoing rapid sketch be correct, it is obvious that great caution is needed in ascribing specific powers to any remedy aided by such powerful adjuncts; from the limited data at my disposal the conclusion at which I have arrived is that beyond a tonic action which it possesses in common with other bitters, the *gall powder* cannot be considered a powerful, certain remedy, in the treatment of fevers of an intermittent type.

With the view of contrasting the result of different forms of treatment I annex the accompanying tables; the Nos. treated are unfortunately small, yet I think they elucidate the preceding statement.

No. 1. *Table showing the number of cases treated by galls.*

Diseases.	*Cured.*	*Not cured.*	REMARKS.
Feb. Quot. Intermittent,	31	1	The average duration of each case 6 days and a fraction.
,, Tert. ,,	6	0	The average duration of each case 5 days and a fraction.
,, Quart. ,,	2	1	The average duration of each case 6 days and a fraction.

No. 2. Table showing the number of cases treated by an Emetic and Purgatives.

Diseases.	*Cured.*	*Not cured.*	REMARKS.
Feb. Quot. Intermittent,	29	3	The average duration of each case 6 and a fraction.
,, Tert. ,,	6	1	The average duration of each case 4 and a fraction.
,, Quart. ,,	0	0	

On these tables I would remark

1st. That they include all the cases treated by galls and purgatives from 24th July to 30th October 1853.

2d. That the average duration applies only to the cases cured.

3d. That in all the cases treated by galls an emetic followed by a purgative was given on admission, the aperient being repeated if requisite.

4th. That the gall powder was given at first in 10 grain doses, afterwards in 20 to 30, three times a day.

5th. That of the two cases not cured by galls both yielded to quinine.

6th. That those uncured by purgatives, were cases which, having been admitted from two to three days before the 30th October, were still under treatment when the report closed.

W. W. HEUDE, M. D.

SEETABULDEE, 21*st March*, 1854.

ASSISTANT SURGEON, 10*th Regiment N. I.*

To

The Superintending Surgeon,
Southern Division,
Trichinopoly.

SIR,

I have the honor to report for the information of the Medical Board, that I administered Koussoo (4 ozs. of which were supplied to me on the 19th instant) to seven adults and one boy, of Her Majesty's 84th regiment suffering from tape worm, and that in every instance the parasite was expelled dead within 18 hours after the exhibition of the medicine. These people had been infested for periods, varying from 4 to 13 years, and several had tried violent remedies, European and Asiatic without, or with only temporary benefit. One man (Private Borebank,) in July last took two ounces of turpentine repeated after an interval of two days, without the slightest effect.

Mode of Administration.

Each patient had on admission a dose of castor oil, which cleared out the bowels and brought away alive one or more joints (of the Tœnia Solium). Having seen these and thus satisfied myself of the existence of the disease, half an ounce of Koussoo mixed with 12 ounces of warm water and allowed to stand for ten minutes, was given with lemonade to each adult, and one and half drachm to the boy. The mess did not look inviting, but it was swallowed without difficulty by the men, and was only partially rejected by the boy. No marked effect followed. One man thought the medicine was slightly diuretic, and another that it "warmed his inside;" in five cases the bowels were moved within 12 hours and the worm ejected, in three cases castor oil was required for its expulsion. I have hitherto failed in observing the head of the animal though I looked carefully for it with or without a glass, but I am disposed to infer that the cure will prove permanent, from

the immense length of the pieces expelled (from 12 to 18 feet) the minuteness of the smaller joints $\frac{1}{8}$ to $\frac{1}{12}$ of an inch and the promptitude and certainty with which the life of the animal was destroyed.

As there are still several cases of this disease in the regiment, I request your sanction to the accompanying Indent for a further supply of the medicine, for though the existence of this entozon is not incompatible with health; it is always detrimental and occasionally dangerous, *e. g.* Private Patrick Delany, of H. M. 84th regiment died in this hospital in August last from phthisis pulmonalis, which was in my opinion caused by the constant irritation and depression of health arising from tape worm. Had Koussoo been known two years ago, that man would probably be now a good and efficient soldier.

Subjoined is an Abstract of the cases treated.

F. W. INNIS, M. D.

Surgeon H. M. 84th Regiment.

TRICHINOPOLY,
Hospital H. M. 84th Regiment,
4th October, 1851.

Abstract

Abstract of Eight Cases of Tape worm treated by Kousso.

Names.	Age.	Country.	Admitted.	Discharged.	Duration of Disease.	Where Contracted.	Medicines formerly Employed.	Present State and Appearance.	Description of Parasite ejected.
Pte. W. Borebank,	38	English,	20th Sep. 51.	22d Sep. 51.	4 Years.	Kamptee.	Turpentine in 2oz. doses. Pomegranate bark and various native remedies.	Very sickly.	Two distinct worms, the smaller joints being $\frac{1}{8}$ inch in Diameter, and many broken pieces measuring in all 48 feet.
,, W. Peacock,	29	do.	24th ,, ,,	27th ,, ,,	9 do.	Moulmein.	Turpentine Garlic Arrack.	Sickly and Dyspeptic.	Passed by the aid of oil 3 yards of the Tenia Solium in many pieces.
,, J. Mara,	29	Irish,	28th ,, ,,	29th ,, ,,	9 do.	do.	None.	Dyspeptic.	Oneworm14feetinlength,thesmallest joints being about $\frac{1}{4}$ inch in diameter.
,, J. Walker,	29	do.	28th ,, ,,	29th ,, ,,	5 do.	Madras.	Turpentine and Pomegranatebark	Strumous and Dyspeptic.	Passed one piece of Tenia Solium 18 feet long, the joints at one end one-tenth inch square those at the other extremity little broader, but one inch in length.
Corpl. Gready,	28	do.	29th ,, ,,	30th ,, ,,	$8\frac{1}{2}$ do.	Moulmein.	One dose of Turpentine.	Healthy.	Passed one piece of 18 feet tapering at both ends the joints being one-tenth inch square at one end and of the same breadth and one inch long at the other end.
John Borebank,	10	Indo Briton,	25th ,, ,,	26th ,, ,,	4 do.	Secunderabad shortly after arrival from Kamptee.	Native remedies.	A Puny boy.	One Piece of Tenia 14 feet long and a few detached joints.
Mrs. Tobin,	23	do.	26th ,, ,,	28th ,, ,,	13 do.	Kamptee.	Turpentine in $\frac{1}{2}$ oz. doses every alternate day for one month.	Healthy.	Ejected by the aid of oil a Tenia 12 feet long with several detached joints.
,, Monday,	25	do.	2d Oct. ,,	3d Oct. ,,	11 do.	do.	Native remedies.	Dyspeptic.	Passed by the aid of oil 4 yards (in one piece) of Tenia Solium dead and discolored.

Trichinopoly,
4th October, 1851.

F. W. INNES,
Surgeon H. M. 84th Regiment.

Patrick Tennyson, Serjeant, aged 30, H. M. 94th Regiment, No. 2 Company, Regimental No. 1696, 10 years' service, 9 years in India.

November 9, 1851.—This patient was in hospital for a few days about a month ago, suffering from a slight dysenteric attack during which period several pieces of Tape worm were passed. States that for nearly seven years, he has been in the constant habit of passing joints of the worm alive in his stools, and at one time a portion measuring 10 yards came away, they also come from him while in bed, and during the day fall into his trousers, has a gnawing uneasy feeling at epigastrium, occasional nausea, and at times a voracious appetite. He is a somewhat spare sickly looking man of muddy complexion.

He yesterday took an ounce of castor oil which purged him freely, bringing away several portions of the worm, and he has abstained from food both last night and this morning.

An ounce of Koussoo having been received from the stores at Cannanore, half an ounce was infused for 10 minutes in 8 ounces of warm water, the whole stirred and taken at 6, 40 A. M.

1, 45 P. M.—No nausea was induced by the medicine, nor any griping. Has just had a copious motion containing quantities of the worm.

7, 30 P. M.—Another evacuation consisting of little but the worm passed in the dead state, some of the joints are very narrow but the head has not been discovered, on washing and measuring all that he has passed, it is found to be 24 yards in length.

11*th November*.—Took Pulv. Jalap Com. 1 dr. and has been once freely purged, passing only one joint of the worm about ½ an inch in length.

12th November.—Had another liquid motion and no worm being observed it may be inferred that the whole has been expelled.

E. J. BARKER,
Civil Surgeon, Malabar.

CALICUT,
19th November, 1851.

Thomas Adams, Hospital Serjeant, aged 27, Sanguineous Temperament, habits temperate, line of life, Tailor, residence in India 7 years and 4 months.

9th November, 1851.—States he first observed parts of tape worm to come away from him about 14 months ago, and he has continued to pass them from time to time attended with an occasional pain in the right hypochondriac region, itching of the nose and rectum and a great appetite. Took calomel, castor oil, and turpentine several times from the use of which he on one occasion passed a worm of nearly two yards in length. His general health appears to be good.

He is directed to take toast bread and tea morning and evening, and soup without vegetables for dinner and to drink freely of lemonade.

20th.—Took four ounces of salts and senna this morning, he is desired to observe the same diet as yesterday. Vespere—passed seventeen live joints of the tape worm (some pieces about an inch long) since morning, attended with much itching of both nose and rectum.

21st, 5 A. M.—Eight ounces of the infusion of Kousso was given him this morning in three doses at intervals of ten minutes.

6 P. M.—Four stools loose, and containing eleven live joints of the worm.

23rd January, 1852.—This patient still continues to pass live joints of the tape worm.

Michael Foran, Serjeant, aged 37, Sanguineous Temperament, habits temperate, line of life, Shoemaker, residence in India 16 years.

19*th November*, 1851.—States that in the year 1839, he first passed joints of tape worm without any uneasiness except a foul breath in the mornings, drowsiness and itching at the nose and a diminished appetite, joints of the worm were passed occasionally in large numbers. Took castor oil and turpentine and cocoanut oil several times from the use of which he was apparently free from them for three or four months when they re-appeared again. His general health appears to be good.

He is directed to use toast bread and tea morning and evening, and to take soup without vegetables for dinner. No lemonade was given to him.

20*th.*—Took a dose of compound powder of Jalap this morning early and he is desired to observe the same diet as yesterday.

Vespere.—Medicine operated once but no worms have come away.

5, A. M.—Eight ounces of the infusion of the Koussoo, was given this morning in three doses at intervals of ten minutes.

6, P. M.—Passed a quiet day, bowels not moved.

23*d January*, 1852.—This patient also continues to pass live joints of the tape worm since taking the Kousso.

Robert Young, Corporal, aged 32, Phlegmatic Temperament, habits temperate, line of life, Labourer, residence in India 11 years.

17*th January*, 1852.—States that in the year 1843, he first observed the tape worms to come away from him in joints of about an inch in length; free of uneasiness or

pain at the stomach or bowels; occasionally he feels a slight itching at the nose and anus, and that his breath is always foul in the morning; appetite natural; he has continued to pass some part of the worms (alive) since 1843 daily without affecting his health; has taken calomel and jalap; decoction of pomegranate and castor oil with turpentine without benefit; ½ oz. of the Kousso infused in 8 oz. of water was given to him at 5 o'clock this morning on an empty stomach as directed by the Board's Circular letter of the 24th October 1851. But he could not take more than ⅔ of it as it made him sick.

Diet—Toast bread and tea and broth for dinner.

6, P. M.—Passed a quiet day, bowels not moved.

23*d January*, 1852.—This patient states, that since taking the Kousso his bowels have become rather costive, and that he has passed no worms.

William Kerr, Gunner, aged 30, Phlegmatic Temperament, habits temperate, line of life, Millwright, residence in India 12 years.

17*th January*, 1852.—States that in the year 1842, he first observed the tape worm to come away from him in joints, has no pain or uneasiness at the stomach or bowels, feels an itching at the nose and anus, breath fetid, particularly in the morning, appetite indifferent, has continued to pass the worms since 1842. His health appears good.

Has tried the following remedies, calomel and jalap, decoction of pomegranate, tender beetle nuts, castor oil and turpentine, and garlic with spirits but without benefit; ½ oz. of the Kousso infused in 8 oz. of water was given him at 5 o'clock this morning which he kept down.

Diet toast bread and tea and broth for dinner.

6, P. M.—Passed three stools since morning, containing 30 dead joints of the tape worm, no other change.

23d January, 1852.—This patient states his bowels are regular and that he has passed no worms since taking the Kousso.

SECUNDERABAD, } J. RICHMOND, SURGEON,
23d January, 1852. } *1st Battalion Artillery.*

CANNANORE, *11th December*, 1851.

To

The Superintending Surgeon,
Malabar and Canara.

SIR,

With reference to the Medical Board's Circular dated 24th October 1851, calling for reports on the effects of Kousso in cases of Tenia, I have now the pleasure to forward the abstract of a case in H. M. 94th Regiment.

	Age.	Total Service.	In India.
Private James Galbraith,....	30	10 years..	9½

September 20, 1851. Vesp.

Scotchman, a labourer, complexion, hair and eyes, dark; Temperament sanguineous, has always enjoyed good health, and never been in hospital before for any serious ailment. Admitted, complaining of frequent ineffectual attempts to defecate, symptoms of two days standing, tongue white, pulse and skin natural.

21st.—Bowels not yet relieved, although he has been frequently at stool during the night, pulse and skin natural, tongue white.

22d.—Bowels were freely moved yesterday, complained last evening of severe abdominal tenderness, had two or three scanty evacuations during the night, and this

morning passed a Tenia, S. about a foot long and apparently whole, tongue white, pulse and skin natural.

November 3d.—Was discharged apparently cured, motions constant and natural, and general health pretty good, has sustained a rather severe attack of dysentery during the interval, but has passed no more Tenia.

November 19th.—Re-admitted with subacute hepatitis and hepatic dysentery, states that he has passed no worm since leaving hospital.

On the 23d, took an infusion of ½ an oz. of Kousso in 8 ozs. of water, without the dregs or leaves, no effects followed.

December 3d.—The patient still continuing to suffer much from bowel irritation. Was ordered 8 ozs. of infusion, and took the leaves or dregs with it, 5 evacuations, brought away about 36 inches in detached joints several living.

December 4th.—Another similar dose brought away about 5 inches, all alive in detached segments.

December 10th.—Has since passed daily two, three or four live joints of the worm in natural evacuations, under the exhibition of simple infusion gentian, the quantity of Kousso issued being expended.

He is improved much in appearance.

December 13th.—Another dose of Kousso (the last in the Medical Stores) this morning expelled 14 detached joints of Tenia Latum without inconvenience for the two succeeding days, the motions were natural and the patient much better.

16*th.*—Tenesmus and abdominal pain being again experienced, took Ol Terebinth 2 drs. Ol Ricini 4 drs. a thin complete Tenia Solium measuring 24 inches was evacuated.

18*th.*—Seven more detached pieces of Tape worm were passed yesterday, and on the 22d having apparently entirely got rid of the enemy, and his health much improved he was discharged.

28*th.*—Re-admitted, complaining of tenesmus and griping, passing blood and slime, no Tenia observed; no constitutional symptoms of importance, has a haggard care worn expression.

Ol Terebinth .... 3 drachms.
Ol Ricini............... 5 do.
Aq. Menth............ 1 oz. ft. Haust. S. S.

29*th.*—A Tenia Solium measuring 12 feet was expelled yesterday, tail broken,—during the night another measuring 5½ feet; tenesmus and griping relieved, pulse and skin natural, tongue white.

The Turpentine appears to have the advantage over the Koussoo in this case.

EDWARD MENZIES, Asst. Surgeon,
H. M. 94th Regiment, in Medical Charge.

Ootacamund, 2*d October*, 1852.

To

The Superintending Surgeon,
Southern Division.

Sir,

I have the honor to report for the information of the Medical Board the following results of the exhibition of Koussoo in the case of an Officer affected with Tape worm.

Captain —— of the 2d Native Veteran Battalion brought to my notice some short time since, that he had and was still continuing to pass worms from the bowels, when they were relieved, and which frequently passed from the anus, whilst he was either walking or sleeping. A few

of these were sent for my inspection, and they appeared to be portions of a tape-worm. As I lately received from Trichinopoly 1 oz. of Koussoo, I thought it a favorable opportunity to try the effects of this remedy said to be a specific in destroying parasites of the kind. On Thursday the 30th September the patient took half an ounce of Koussoo infused in 8 ounce of water at 3 P. M., at 4 P. M. he was excessively nauseated but did not vomit; before he retired to bed about 9, the bowels had been relieved six times but no worm had passed. Between 6 and 7 A. M. the next morning, 1st October, he passed from the bowels what appeared to him to be a large lump of mucus, after this the bowels were relieved twice. Motions of various colors from dark-green to yellow. I visited him between 12 and 1 and on examining the motion passed between 6 and 7 I found it to consist almost wholly of the Tape worm, which did not appear to possess any life. Captain —— has had the worm measured and finds its length to be 18 yards, and if to this is added about 150 pieces which he states had previously passed from him, and which he supposed to be distinct worms, each an inch long, and some that I inspected were longer, the whole length of the worm would be upwards of 66 feet. Captain —— had for a long time suffered from disagreeable sensations in the bowels, with great disinclination to exercise, and indescribable feelings over the body, with a sensation as of a large collection of some kind or another about the right side of the umbilical region, which was immediately relieved on the worm being passed off.

B. S. CHIMMO, Assist. Surgeon,
Medical Officer, Neilgherries.

ANNUAL MEDICAL REPORT

Of the Civil Dispensary at Rajahmundry for the year 1852.

The returns accompanying this Report exhibit a marked increase over the numbers treated in the institution during

the year 1851, 174 individuals have been admitted into hospital, and 473 attended as out patients. The out patients still bear a low ratio to the class treated within the walls which must be attributed to the fact that advice is not sought in the more simple diseases, or in the premonitory or earlier stages of the more important; that the Native practitioners are still trusted till disease puts on a severe type, or has advanced to that stage in which their remedial measures manifestly fail, or they themselves acknowledge their inability to treat the case further. The only disease witnessed in its earlier stages, and before organic changes have been manifested, is intermittent fever; and this is to be attributed to the faith which the natives have acquired in the remedial powers of Quinine.

The following abstract of the tabular returns shews the general results of the year.

In Patients.

	Males.	*Females.*	*Total.*
Remained 31st December, 1851,...............	4	2	6
Admitted during, 1852,...............	132	42	$\frac{174}{180}$
Discharged, Cured,......	60	22	82
Do. Relieved or absented,................	47	10	57
Died,......	14	5	19
Per centage of deaths, ...	10·2	11·6	10·5

Out Patients.

Remained 31st December, 1851,......	5	4	9
Admitted during 1852,........	381	83	464
Discharged, Cured,............	210	70	280
Relieved or absented,................... ...	169	15	174
Died...............	0	0	0
Per centage of deaths,..........	0	0	0

The ratio of mortality is still high (owing to the serious nature of cases admitted) and contrasts strongly with that amongst the prisoners in the jail which is only two per cent; sufficiently attesting to the truth of the remark made above as to the cause of the mortality. I now proceed to the several subjects of informations required by the Board's Circular letter dated 19th November 1852.

1st. General Observations bearing upon climate, &c.

This subject will be fully dwelt upon in the report for the Zillah.

2d. A detailed narrative of any Epidemic, &c.

No epidemic disease has visited the town of Rajahmundry during the past year, and the district generally has been equally free from any visitation of the kind.

3d. Remarks upon the principal classes of disease, &c. &c.

A glance at the abstract of the table of sick of in-patients will shew the principal classes of disease for which advice has been sought. Taking the table in the order in which the entries are made, under the head of "Fevers" 13 admissions are exhibited with four deaths. These fever cases comprise one of febris ephemera, eight of febris quotidian intermittent, three of febris continua communis, and one of febris typhus. The mortality pertains only to the two latter forms, viz. febris continua and typhus *every* case being ost. The patients were admitted in very advanced stages, comatose, or delirious, with "subsultus tendinum,"—dry brown tongues,—involuntary evacuations, sordes about the teeth, and other usually considered fatal signs. They were cases in which a most unfavourable prognosis was given from the commencement. Quinine with wine, the former in 10 and 20 grain doses frequently repeated was administered, and with the effect of lowering the pulse only, no beneficial influence having been exerted upon the other symptoms, indeed it appeared rather to aggravate the cerebral symptoms. The cases will be found reported upon in para. 4. In the first case that of Droogah the symptoms on admission were not so serious as in the other cases. Quinine in large doses was administered from the commencement to the termination of the case in conjunction with moderate local depletion. Cold and blisters to head —calomel and James' powder with wine, which latter was clearly called for by the state of tongue. The treatment at

first appeared to improve the condition of the patient; but death occurred on the 7th day of treatment. The 2d case deserves only passing notice, the patient being admitted moribund, and in a condition in which medicine could clearly be of no avail. The 3d case was a servant of the native surgeon who had been under treatment for some days by Mr. Bauloo at his own house. On admission he was comatose, had pungent heat of skin—a quick small pulse,—sordes about the teeth,—subsultus and picking of bed clothes. He also was ordered large and frequently repeated doses of quinine with wine; but no improvement followed, and he died on the 4th day after admission. The 4th and last case was one in the first instance of intermittent fever terminating in continued. The patient on admission was incoherent but could be roused—had general tremors—pulse 120 and small—a furred but not a dry tongue, and passed her evacuations involuntarily. Quinine in large doses was given—she died on the 5th day after her admission into hospital.

The treatment of fevers both of the remittent, continued and even typhoid type, by large and frequently repeated doses of quinine has many advocates, and in the hands of many practitioners has apparently been attended with the most beneficial results, cases even as far advanced as No. 1, 3 and 4 now detailed, having been brought to a satisfactory termination. The effect of the remedy is said to be evinced by falling and softening of pulse, lowering of heat of skin, cleaning of tongue, copious perspiration and clearing of the mental faculties. In a late number of the Edinburgh medical journal, professor Bennett gave the system a fair trial in cases of relapsing typhoid, and true typhus fever, treating at the same time a certain number of the same description of cases carefully selected, upon the usual system; the results were not particularly if at all in favour of the large doses of quinine system, though the professor remarked,

that the medicine certainly lowered the frequency of the pulse, and diminished the heat of skin, beyond this it appeared to exert no beneficial influence. In the cases here detailed the same results are noted. In no case did the copious sweats alluded to by some writers occur. It will be remarked that in the last case, after quinine had failed to produce any of the signs of improvement looked for, the much vaunted nostrum Warburg's fever mixture was administered and which I need scarcely remark is almost satisfactorily proved to be a concentrated solution of quinine. This also reduced the pulse after the 2d dose from 120 to 112, and moderated the heat of skin; in fact the native surgeon reports "no fever;" no relaxation of skin however followed as is said to be invariably induced by this medicine, on the following day some hopes were entertained that it had really brought about an improvement as the stupor was less; the pulse had risen to 140 however and there was subsultus tendinum with cadaverous odour from the body which I pointed out to Mr. Bauloo (by whom the case was reported and watched with much interest and care) far outweighed in prognostic value, the slight improvement in the cerebral symptoms.

Only one case of eruptive fever has been admitted during the year. A case of small pox in the confluent form which did well. The pocks on the face were treated with nitrate of silver and certainly with the effect of preventing such an amount of pitting as the confluence of the eruption rendered probable.

In "*Diseases of the Lungs*," the next most important class, mortality has been high, six cases being tabulated with five deaths. Of these six cases, two were phthisis, three pneumonia and one is entered catarrhus chronic, but the fact is the nature of the pulmonary disease in this latter case was not satisfactory determined; the patient on admission being so extremely weak that a satis-

factory examination of the chest could not be instituted. He was admitted on the 13th and died on the 15th of January. The case was doubtless one of phthisis, there being profuse purulent expectoration with emaciation and anasarca of the lower extremities. The cases entered phthisis were both admitted for other diseases, one with a wound the result of a gore from a bullock, the other with a tumour on the left groin. Both patients were emaciated, had constant cough with night sweats and anasarca of the lower extremities. In the first case physical examination pointed to an advanced (3d) stage of tubercular disorganization, and in the 2d case the disease had entered its 2d stage that of softening and diminution. Cod liver oil was given in both cases, but without arresting the course of the disease. The gums were examined in both instances and the red Gingival margin" brought to notice by Dr. Theophilas Thompsom as existing in many cases of phthisis could not be detected. The condition of pulse alluded to by Dr. Guy as existing as a marked characteristic in the disease, viz. the absence of that difference in frequency between the pulse in the erect and horizontal posture—did not exist in either; being much quickened on assuming the erect from the supine posture. The cases themselves are not entered in para. 4 as they exhibited no points of particular interest further than has reference to their utility as cases for clinical study to the native surgeon and medical subordinate.

The cases of pneumonia were also instances of advanced thoracic disease. Two cases were of considerable interest in a diagnostic point of view and are abstracted in para. 4. In the first case it will be observed that on admission there were all the general and physical signs of the 2d stage of pneumonia (hepatization) combined with pleurisy with the exception of tawny or rust colored sputa regarding which I shall presently offer a few remarks. Under

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the use of calomel and opium with tartar emetic and a blister to chest, the cough and dyspnœa subsided and these signs of improvement, were attended by a return of the respiratory sound in the upper region of the affected lung. The patient continued to improve as concerned the thoracic symptoms till the 30th of September when he suddenly coughed up a large quantity of abominably fœtid pus, the pulse got up and hectic set in. The fœtid character of the sputa made me suspect gangrene of the lung, though it might also be accounted for upon the supposition that a circumscribed empyema, till then undetected, might have opened into the lung, or the inflammation of the lung terminated in circumscribed abscess. Physical exploration of the chest gave the following results; dulness on percussion universal; but most marked in the lower regions of the right chest, bronchial respiration which acquired a great intensity about two inches above and to the right side of the nipple, the respiration here also was cavernous (blowing) but not distinctly amphoric, and percussion elicited the "bruit de souflet; the physical signs indicated a cavity *in* the lungs and not external to them and yet this diagnosis necessitated either the termination of the case in circumscribed abscess, or gangrene; since the existence of a vomica from tubercular disease was negatived both by antecedent and existent signs and symptoms. The case was watched to its fatal termination with much interest, and necropsy proved the correctness of the opinion formed, viz. the existence of a cavity *in* the lung; though I was unable positively to determine whether the cavity was attributable to abscess or gangrene, for though the sputa had all the fœtor of gangrene, the lung itself had no gangrenous odour but on the other hand the adjoining pleura, had the greenish black color of gangrenous action and had an ulcerated opening communicating with the cavity of the lung, though no cavity could be detected

in the pleura itself. The substance of the lung itself surrounding the cavity which was empty was soft, friable, of a greenish color and infiltrated with pus, indeed in the 3d stage of Pneumonia or that of purulent infiltration. The whole lung was bound down by strong bands of false membrane to the pleura costalis. There was also seropurulent effusion into the cavity of *left* pleura.

The next case is one of pleurisy and pneumonia combined and presenting a circumscribed empyema between the base of lung and diaphragm, a condition not I conceive to be detected during life by any physical signs.

It will be remarked that in this case also the sputa was not rusty, and the result of my limited experience is, that rusty colored sputa is not frequently met with in the native as a symptom of pneumonia, indeed I cannot call to mind a single case in which the tenacious rusty colored sputa, existed, although there were all the physical signs of pulmonary engorgement or hepatization.

The two casualties under the class of "*diseases of the stomach and bowels*" were advanced cases of diarrhœa though one ought rather to have been termed dysentery. The cases are not detailed as they presented no features of particular interest, they both occurred in women who had been subjected to distress and want, and who came to hospital to save themselves from perishing in the streets.

The *diseases of the Brain* comprise two cases of apoplexy and four of paralytic affections. Only one of the two fatal apoplectic cases is noticed in para. 4, since in it only a post mortem examination was made. The symptoms were associated with inflammatory softening of the *right* anterior lobe of cerebrum, and of grey matter of left optic thalamus. The motores oculi nerves were also noted to be soft and almost diffluent. There was paralysis of *left* side of body and *face also,* the mouth being drawn to the *right.* The right eye drawn upwards and

outwards and the pupil dilated, while the left pupil was contracted, these symptoms are worthy of notice in connection with the cerebral lesions.

Under the head of "*Dropsical affections*," eight cases were admitted into the building; three are entered anasarca, two general dropsy, one beriberi, one ascites and one morbus cordis; four were discharged relieved of their dropsy, two died and one remains under treatment. All of these cases were instances of dropsy depending upon organic disease; the two fatal cases were both instances of general dropsy, from diseased heart, anasarca only existing on admission; but ascites and subsequently hydrothorax complicating and eventually bringing them to a fatal termination; four were cases of Bright's disease of the kidney, though one from there being numbness of the lower extremities was entered beriberi. The remaining cases (2) were, one ascites from diseased liver and the other dropsy from diseased heart, so that they ought to be classed thus; heart disease three, renal disease four, chronic disease of the liver, one; the dropsy being only a symptom; five of these dropsical cases are entered in para. four, three of renal disease and two of heart affections; 15 cases of dropsy also came under observation amongst the out patients, but none of them were watched to a termination, the parties generally being quite satisfied with the removal of the dropsy itself, and refusing to remain under treatment for the organic disease upon which the effusion depended, and which in many cases I believe the patients considered to exist only in my imagination, since they could not be made to associate the dropsical swelling with a little "breathlessness on exertion" or a slight "albuminous condition of the urine." "*Rheumatic affections*" have been prevalent, mostly of a subacute, or chronic form. It is said that acute rheumatism amongst the natives of India is not so prone to induce organic affections of the heart as in Europe. Dr. Chevers of the

Bengal service, whose labours in this field of inquiry are so valuable, is of the same opinion. In very many cases of diseased heart however which have come under my observation, I have directly traced the affection to antecedent rheumatism.

I need scarcely comment upon the other classes of disease such as "venereal affections," "ulcers &c.," which swell the number of admissions in all hospitals and especially in those opened to the poor. No capital surgical operations have been performed; cases requiring such measures have been admitted, but the patients have not consented to operative measures; minor operations have been pretty numerous, such as paracentiasis abdominis, operations for hydrocele, for phymosis, stone in the urethra, &c., but these scarcely deserve notice. The native surgeon Mr. Bauloo has performed the majority of them. The remarks above recorded apply almost exclusively to cases treated in the hospital. The treatment of "out patients" so far as keeping cases worthy of analysis is not very satisfactory. The patients not only being irregular in their attendance, but frequently not re-appearing after their first visit.

Before proceeding to the detail of interesting cases I may remark that the sum of Rupees 447-5-2 has been expended from the "poor fund," alluded to in my last annual report. This sum has partly been appropriated to procure additional comforts for the sick in hospital, and partly in obtaining medicines not included in the supply from the medical stores and instruments.

4. Special remarks upon cases of disease which have been particularly worthy of notice.

Febris continua communis. Droogah, dancing caste, aged 25, was admitted on the 4th March 1852. His condition on admission was as follows, "patient in a state of stupor, roused with difficulty, replies to questions only in monosyllables, tongue dry and

loaded with a brown fur, skin hot but not pungently so, pulse slow (60) regular, body emaciated, decubitus on back, no subsultus." The head was shaved, leeches applied and subsequently cold, which was kept up assiduously and constantly by means of a funnel and sponge fixed to his cot above his head. He had also a dose of calomel and James' powder and a purgative enema. It was considered a good case in which to try large doses of quinine which was administered in 10 grain doses every three hours with wine; the latter being indicated by the state of tongue. On the morning of the 6th the report is "somewhat better though there is still much stupor, pulse 60 regular, tongue moist and cleaner, skin not above the natural temperature, bowels freely moved by medicine." He now had a blister to back of neck, calomel and James' powder each two grains twice a day, continuing the quinine with wine. On the 8th it is reported "not so well," since 6 A. M. there is increasing stupor and the decubitus is on the back exclusively. No subsultus or picking of bed clothes, tongue moist, can scarcely be roused. His sister who attends to him says that he appeared much better during the night, that he talked to her and then appeared to sleep calmly." Pergat. 9th, more easily roused, bowels free, tongue moist; "10th, worse, decubitus on back, stupor intense, can just be roused to open his eyes, respiration hurried, tracheal rales; P. M. expired comatose.

Commentary.—The improvement, trivial although it was, noted on the 6th, especially the moisture of the tongue and reduction of the temperature of the skin, warranted the hope that more permanent and decided amelioration of symptoms would occur, and the quinine was continued; on the 8th, symptoms were less favourable, but on the 9th, again he was more easily roused and the tongue continued moist, this apparent improvement soon gave

place to more confirmed stupor which ended in death. Body not examined.

Case 2d.—Shaik Hoosain, admitted 28th October, (reported by Mr. native surgeon Bauloo) admitted with fever of tyhoid character, skin not very hot, tongue dry and parched (he should have added also brown) pulse small and quick, urine scanty and high colored, subsultus tendinum with low muttering delirium."

Previous history.—On the 10th, had complained of slight fever and head ache, of restlessness at night and inability to any kind of exertion, this confined him to bed; he had taken different kinds of fever mixtures without the slightest effect in checking the progress of the disease; the fever generally exacerbated in the evening; from the first he appeared depressed; on the 27th as he became delirious he was sent to hospital.

28th, pulse small and weak, tongue loaded with brown fur, black sordes collected around the teeth, skin harsh, delirium, body shaken with subsultus tendinum; the head to be shaved and cold applied, R. quinine disulph 10 grs. port wine 1 ounce every 4th hour. 29th now become comatose, does not answer questions, when frequently told aloud to protrude his tongue, does it with great difficulty, (a state of stupor rather than coma) continue medicines. 30th, no better, countenance collapsed, tongue black, pulse small feeble, extremities cold, cadaverous odour from the body; expired towards the evening.

Case 3d.—(Also reported by Mr. Bauloo) Paupah aged 28 admitted 18th November 1852, with fever and delirium. Has been subject to fever for four months which came on her irregularly, every 10th or 12th day; the present attack took place 10 days before, and from that day there being no intermission and the patient growing worse she was brought to hospital; present state, skin hot, body tremulous, speaks incoherently, pulse 120 small, tongue

highly furred, sordes collecting about the teeth, urine and fœces involuntarily, R. quinine disulphas 20 grs. mist camph. 1 ounce, acid sulph. drops xv, every fourth hour if no ringing in her ears be occasioned; shave the head and apply cold lotion. 20th four doses of quinine given and there is no improvement, becoming more delirious, stools and urine involuntary, pulse 120 small, fails in speech, the whole body tremulous; quinine 5 grs., port wine 2 ounces every two hours, continue cold to head; 21st no better, continue; 9 P. M. skin harsh, dry and warm, pulse 120 regular, tongue dry, fœces and urine passed involuntarily, extremities cold; Warburg's fever mixture, ½ bottle immediately. 12 P. M. skin hot and dry, pulse 120, tongue dry, exhausted, cold, no sweat, repeat medicine, (Warburg's fever mixture) 2 A. M. no fever but skin is dry, pulse 112, no perspiration, tongue moist; 4 A. M. 22d, skin warm and dry, pulse 140 and irregular, tongue dry; 22d is sufficiently sensible to attempt to put out her tongue when desired, pulse 140 regular, skin pungently hot, tongue dry, subsultus tendinum, cadaverous odour; wine adlibitum, vespere worse, pulse imperceptible, lying in a state of perfect coma. 23d, expired.

In these three cases a fair and patient trial was given to the large dose of quinine system with what result has been detailed. It may be urged that the patients were in too advanced a stage of fever for any treatment to have availed; but then it is just in such advanced stages that if the large doses of quinine are superior to other methods of treatment we are warranted to look for results not generally attainable by other means. In less advanced stages, that is before the dry tongue, sordes about the teeth, subsultus, &c. exist, the majority of cases do well upon almost any treatment, the simplest often the best. It was not to be ascertained whether the quinine produced its characteristic effects upon the system since the patients were unable to speak, or if to speak to com-

municate their feelings. The advocates of the system affirm that if once "ringing in the ears" be induced, the patient is safe, and the alkaloid is administered till that effect is produced, and if not produced within a reasonable time every other treatment it is said will fail, the patient will assuredly die. The Warburg's fever mixture failed to produce any of its alleged effects, no perspiration followed its administration.

Case 4th.—Pleuro Pneumonia terminating in circumscribed abscess of the lung.

Ramasawmy, aged 40, caste Malabar, was admitted on the 19th of August 1852, with cough, dyspnœa and fever of about a month's duration. The expectoration was copious, but difficult, mucopurulent, frothy (a mark only of the difficulty of expectoration) and diffluent; he had pain in the right side of chest, pretty acute and aggravated by cough and deep inspiration, dyspnœa rather urgent, pulse 96 regular weak; the physical signs were, immobility of right chest considerable; generally dull on percussion, intercostal spaces not obliterated and dullness not varying with change of position. The respiratory murmur was absent in the lower lobes of lung, and very faint below the clavicle, vocal and tussal fremitus increased and the voice bronchophonic, left lung healthy. He was ordered small doses of calomel and opium with a cough mixture and had a large blister to chest; the calomel had to be omitted on account of diarrhœa; but was resumed as soon as it was checked. The patient improved and there were signs of commencing resolution in the lung, the respiratory murmurs being more pronounced in the upper lobe. The cough and dyspnœa were so much moderated that the patient expressed himself much relieved. On the 24th of September the cough returned, physical examination gave the same general symptoms. On the 30th September he suddenly expectorated a large quantity of purulent matter, highly fœtid, so much so that the

patients generally complained; his pulse got up and hectic set in; his chest was again carefully examined, for his sudden purulent expectoration invested the case with peculiar interest; the chest (right) was generally dull, there was no bulging of intercostal spaces; just above and to the right of the nipple, bronchophony, which existed over the right generally, was intensified. On more carefully examining this region, percussion elicited the "bruit de pot fele;" but there was no increased resonance, the region was markedly dull and resistant; respiration though cavernous was not amphoric and no metallic tinkling could be detected; upon these signs it was diagnosed that a cavity existed in the lung, the patient lived till the 9th. The body was examined, the right pleura shewed marks of acute and somewhat recent inflammatory action, the lung was every where adherent to the ribs, the adhesion was firm, but readily broken down by the hand, except in one spot where, the knife had to be used, and this was at the site of the above recorded physical signs; on attempting to get out the lung here, it was friable and easily torn down and the adjacent pleura was of a dark greenish black colour though without any odour of gangrene. The lung on removal presented a cavity about the size of a small orange. The surrounding lung tissue was soft and infiltrated with pus, in fact in the 3rd state of inflammation, that of purulent infiltration, while the lower lobe of lung was hepatized, sinking in water. The pleura in connection with the cavity in the lung was ulcerated, but no actual communication could be traced between the cavity in the lung and any cavity in the pleura—there was some effusion into the left pleura, but no marks of inflammatory action—the left lung was healthy. There was also a small cavity on the upper lobe of right lung but no tubercular deposit, at least none that could be detected by unaided vision. The case is interesting and clearly one of abscess, a rare termination of inflammatory action. The fœtor of the sputa pointed to

gangrene, but no gangrenous odour existed after death. The physical signs pointed to a cavity in the lung and not exterior to it. Though notwithstanding I rather expected to find a circumscribed empyema, which opening through the pleura, had emptied itself through the bronchi, though it is true, that had this been the case increased resonance on percussion from admixture of air, instead of increased, dullness, would have existed.

Case 5th.—Pleuro pneumonia with circumscribed empyema Ramaswamy, Malabar caste, aged 80. Case reported by native surgeon Bauloo "Admitted 1st November 1852, in a state of half consciousness; present state. (The history of his case could not be made out as he could not answer questions put to him) has cough with expectoration of muco-purulent matter flowing easily from vessel and not rusty, no respiratory movements of right side of chest which is dull on percussion. On auscultation of right side, large moist crepitating rales could be distinctly heard. The left side is also dull on its posterior inferior part and the crepitating rales could also be heard here (Mr. Bauloo should rather have said fine but moist crepitation as at the time I explained to him that I was doubtful whether they were indicative of capillary bronchitis or pneumonia, as they though fine, they were rather too large and liquid for the crepitation of pneumonia, while at the same time the dullness on percussion was too pronounced to depend upon the congestion of capillary bronchitis) pulse small 120, tongue furred, bowels torpid. Pulv gregor 2 scruple gum ammoniac 10 grs. tinct scillæ 10 min. mist mucilag 1 oz. ter in die. 3rd, cough troublesome, pulse 120 small and feeble, bowels moved freely. 5th, again examined and the same sounds (fine crepitation in both lungs) heard, R. calomel 2 grs., pulv. ipecac, 1 gr. ter in die; mercurial ointment to be rubbed into the thigh (the patient was considered too feeble to administer tartar emetic, and the induction of slight mercu-

rial action offered the best hope of amelioration of his condition; the prognosis was most unfavourable.)

6th no better, respiration 28, pulse 120 small. Right chest scarcely expands, percussion gives dulness of the whole right side, greatest posteriorly below the scapula; auscultation reveals large somewhat moist crepitating rales mingled with a friction sound and bronchophony, no bulging of intercostal spaces; can with difficulty be brought to understand or reply to questions, is in a half comatose state, but occasionally gets up and wanders about the ward; continue mercury and frictions, large blister to right chest; diet wine and conjee. 8th, does not improve, mouth not tender. 9th worse, respiration more rapid, pulse very small and quick. 2 P. M. gradually got worse since morning, 2½ expired.

Post mortem examination of body, somewhat emaciated, thorax, lungs more or less adherent to walls of chest, on right, the adhesions vascular and easily broken down; in left, more dense but recent, anterior border of both lungs pale and crepitant, no effusion into cavity of pleura; but on attempting to separate the right lung from the diaphragm pus escaped, and a cavity bounded by false membranes was found between the base of lung and diaphragm not communicating with thoracic cavity, lower portion of right lung hepatized, sinks in water, and yields on pressure mucopurulent matter; the division into lobes lost from pleuritic adhesions, upper lobe congested but crepitant. Bronchial glands affected with melanosis; left lung congested but crepitant, floating in water. Heart healthy, liver much enlarged, congested and indurated.

Case 6th, *Apoplexy.*—Inflammatory softening of the right anterior lobe of cerebrum, of grey matter of left optic thalamus and motores oculi nerves.

Sooborrydoo, Gentoo, cooly aged 30, was admitted on the

5th June 1852 in a state of almost complete coma, being roused only with the greatest difficulty; mouth drawn to right side, right eye drawn upwards and outwards, pupil dilated barely sensible to light, eye-lids open not sensible to the stimulus of a touch or prick. Pupil of left eye contracted, left arm and leg motionless, pulse soft and quickened. The friend who brought him to hospital stated that 15 days before admission he complained much of headache and had high fever, and that 5 days before admission he suddenly fell to the ground insensible, and continued so, the stupor day by day deepening in intensity; he was ordered 24 leeches to the head, which was shaved; ten grains of calomel was placed upon the tongue, for the power of deglutition was lost, and his bowels relieved by a turpentine injection. The following day the 6th, there was no improvement, strabismus and inability to swallow continued, there was no convulsive action, the pulse 72 soft, both pupils contracted; bowels only relieved by the enema. Calomel and croton oil were repeated, and a large blister placed between the shoulders and back of neck. He continued in this state till the 9th, perfectly hemiplegic in a state of almost perfect coma, though not perfect since by bawling in his ear, he would just evince consciousness by opening his eyes. On the morning of the 9th, he is said to have spoken, but at my visit the coma was perfect; he was totally dead to all external impressions, though there was no stertor. On the 10th he expired. The head was examined. The following is an abstract of the notes taken.

No particular congestion of vessels of scalp; on removing the skull-cap, the dura mater appeared healthy, free from any thickening. The arachnoid was however considered firmer and denser than was consistent with a healthy condition, and of a milky opacity. The sinuses and vessels of brain highly congested. The substance of the brain was highly vascular and the cortical had a deeper

color than natural. The right anterior cerebral lobe was softened, not so soft as to be washed away by a stream of water, but adhering to the knife on section, there was greater softening of the grey matter of left optic thalamus, the brain substance being easily washed away by a stream of water, leaving a small cavity, the size perhaps of a nutmeg. The motores oculi nerves were also softened. There was no fluid in the ventricles and base of brain, the softening was judged to be of inflammatory origin, the opinion being framed upon the general vascular state of the organ, and the absence as far as could be detected by unaided vision, of any disease of the cerebral arteries; the softened brain tissue was not subjected to microscopic examination.

Case 7th.—Hypertrophy with dilatation and valvular disease of heart, and dropsy.

Audenorroydoo, Gentoo, aged 40, admitted 9th July 1852, ill two years with oppression at chest, dyspnœa and dropsy. Is at present emaciated, dropsical, the face being especially swollen, respiration 40, pulse 80, regular—large thrilling but compressible, the physical signs referrible to the heart, determined by frequent careful auscultation, were the following, hearts impulse increased, the stroke being seen and felt two inches below and to left of nipple, and communicating a thrill (fremissement cataire) to the hand, considerable increased dulness in extent on percussion with venous pulse; which signs in the aggregate pointed clearly enough to hypertrophy with dilatation; (the latter most probably affecting the right ventricle and accounting for the dropsy) and regurgitation, of blood from right auricle into the large veins; the hearts sounds, were also morbidly altered, a distinct harsh bruit very much increased in intensity on the least exertion, but always existent even in moments of perfect quietude (sufficient evidence of its dependence upon val-

vular disease and not upon the attenuated condition of the blood, though the latter doubtless contributed to its distinctness) and heard loudest at the base of heart, diminishing in intensity on approaching the apex and accompanying the first sound, the bruit therefore was referrible most probably to the aortic valve; though since it (the bruit) was audible also at the apex, it was considered probable that the mitral was also diseased.

The patient was ordered diuretics with tincture of iron to counteract the existing anæmia with mild aperients (active purgation being inadmissible owing to a tendency to diarrhæa,) and diaphoretics to remove dropsical effusions; while the heart's action was controlled by opium and belladonna plasters. Digitalis also was administered with caution, since it is not generally admissible in valvular disease. Under the treatment the patient enjoyed comparative relief; the dropsy was entirely removed, the heart's impulse moderated, and the bruit lessened in intensity, while the iron was beginning to restore a more healthy colour to the skin and lips. At this stage however, September 27th, the patient persisted in leaving the hospital, to be re-admitted on the 25th October in a most unfavourable condition, universally anasarcous and very weak. He again however improved but eventually succumbed. On the 24th of November, the body was examined and the following points noted relative to the heart. Pericardium non vascular, contains 5 ozs. of clear serum unmixed with lymph. Heart evidently enlarged. The wall of the left ventricle hypertrophied, that of the right, normal; right ventricle dilated. The aortic valves did not appear thickened, but had a deposit at the base of atheromatons matter. The mitral valves were thickened and affected with a similar deposit.

Case 8th.—Dropsy from hypertrophy and dilatation of

heart with valvular disease. S. Bamah, aged 50, Gentoo, a large woman admitted on the 25th of September with general dropsy. It may suffice with reference to this case to say that all attempts to remove the dropsy either by diuretics, purgatives or diaphoretics failed and that death eventually occurred by hydrothorax. The cause of the dropsy was obscure, the case diagnosed rather by negative than positive signs. The urine was not albuminous and yielded no microscopic elements of kidney disease, so those organs were excluded from any share in the dropsy. No enlargement of any of the abdominal viscera could be detected, and anæmia or debility had obviously no connection with the symptoms. It only remained then to look to the heart, and here the signs were not very marked. A slight bruit with first sound, certainly existed, but no satisfactory evidence was obtained of enlargement of heart especially of dilatation of right ventricle; necropsy however proved that the heart was the organ at fault, the right ventricle being delated and the walls of the left thickened, one of the aortic valves presented a small mass of coagulated lymph. The mitral valve felt thickened, the wall of the left ventricle was 9 lines thick.

This enlarged state of the heart could not be detected owing to the difficulty of satisfactory examination by percussion, the patient being very obese. The heart affection was preceded by pains all over the body, probably rheumatic.

Case 9th.—Anasarca and ascites of renal origin, Sashiah aged 3 years, Gentoo, admitted 30th December 1851, with general dropsy, abdomen much distended, areolar subcutaneous tissue loaded, face much swollen, eye-lids especially, skin harsh and hot, urine very scanty. His mother stated that about 6 months previous to admission swelling of the eye-lids first appeared, and slowly the

whole body became dropsical. The urine reduced to a minimum, not exceeding an ounce in 24 hours, was highly albuminous becoming almost a solid mass on the application of heat, was turbid and dirty in appearance, and under the microscope each drop was loaded with Epithelial and granular casts of the tubuli uriniferi. He was put upon purgative and diaphoretic treatment. On the 1st of January dyspnœa was so urgent that paracentisis abdominis was proposed, but the parent would not consent, and removed the child the next day from the hospital.

Case 10th.—Anasarca, Bright's disease of kidney Pakeerah, Gentoo, aged 20 was admitted on the 4th Feb. 1852, with a gangrenous sore on the lower lip, and scrophulous ulceration of glands of the right side of neck; the lower lip was destroyed to the reflection of the lining membrane upon the gum; nitric acid arrested the sloughing process and the sore began to cicatrize, when on the 15th he brought to notice that the feet were œdematous and the urine scanty. It was found to be 11 oz. in 24 hours of sp. gr. 1024, and albuminous; the deposit given to heat and nitric acid occupying $\frac{1}{8}$ of bulk tested; a more concise history was now elicited to the effect that the feet became œdematous shortly after the breaking out of the ulcer upon the lip, that the skin had long been harsh and unperspirable; but that his general health had been pretty good. On close examination there was heat of the skin especially over the lumber region. The tongue was large pale and marked by the teeth, the urine was passed frequently especially at night, no lumbar tenderness, but pain on pressure at the umbilicus; had been profusely mercurialized by native doctors. He was ordered diaphoretics, mild diuretics with tincture of iron, a warm bath every second night and the following, diaphoretic draught at bed time; Tinct guaici $\frac{1}{2}$ dr. treacle

1 oz. milk 6 ozs. to be given, hot. A microscopic examination of the urine gave abundant casts of the tubuli uriniferi, many containing oil globules, the majority however epithelial or granular; under the treatment adopted the anasarca diminished and the ulcers on the lip and on the neck cicatrized kindly; and on the 26th it is reported "ulcer of the lip healed; patient discharged at his own request.

Case 11th.—Anasarca, Bright's disease of the kidney, Sutteyadoo, Gentoo, aged 20, admitted 9th July 1852, with general anasarca; the patient stated that he had been two months ill, that he was ill only one day with fever, before the setting in of the dropsy which first commenced in the feet; on admission the skin was hot and dry, pulse 80, soft regular, tongue large, pale, furred and fissured, no pain in loins, urine highly albuminous. Specific gravity 1005, loaded with fatty or oily epithelial cells and tube casts, the majority oleiferous; he was cupped on the loins and ordered digitalis with cream of tartar and liq ammon acetatis with guaicum and hot milk at night. Leeches to the loins were applied at intervals and blisters; the report of the case is a lengthy one as the urine was examined daily; suffice it to say that under the treatment the dropsy was gradually removed, the urine became less albuminous, though never entirely free from albumen, but the specific gravity never rose above 1007; the progress towards improvement was very slow, for an attack of pericarditis (indicated by uneasiness, scarcely pain, at heart, with tumultuous action, pain on pressure over the intercostal spaces and friction sound) had to be combatted by rather active measures and on the 11th of September he left hospital to place himself under a native doctor, who gave him violent purgatives, put him on a rigid diet without salt, and gave him ol nigrum. He got worse, and again

came to me on the 26th October with ascites in addition to anasarca but would not remain in hospital. He was treated at his own house and finally died, though at the time of his death he was again in the hands of the native doctors. The urine of this patient was often subjected to analysis and the blood once. The former both in relation to the specimen examined and quantity excreted in 24 hours gave a great reduction in the quantity of urea. The analysis of the blood gave the following results per 1000 of blood, shewing a great excess of fibrine and accounting for the proneness to inflammatory action; a great reduction of the blood globules, and a slight, diminution, in the solids of the serum; corresponding very closely with the analysis of many observers in the same disease in Europe which is given as.

Fibrine............	10·12
Red Globules........	86·61
Solids of Serum......	72·87
Water............	830·40

Fibrine..	3·2 to 10 (?)
Globules..	82·0
Solids of Serum...............................	80·0

The case of "Beriberi" with albuminous urine I shall have occasion to notice in my Zillah report, in which that disease will receive attention in connection with my remarks upon it in my two last annual reports, I wish however to take this early opportunity to modify my previously expressed opinions, since I have met with cases of considerable anasarca with numbness or paralysis of the lower extremities without any albuminous impregnation of the urine, or any evidence of organic renal disease.

I do not comment upon the remaining fatal cases since they present no features of peculiar interest.

J. L. RANKING,
Civil Surgeon.

RAJAHMUNDRY,
1*st January*, 1853.

ANNUAL MEDICAL REPORT OF THE CIVIL DISPENSARY AT MANGALORE FOR THE YEAR 1852.

Before entering into a detailed history of the Civil dispensary at this station for the past year, agreeably to the "extract from the revised code of medical regulations," lately forwarded to medical officers, with the view to their reports being drawn up in a concise and uniform style, I may be permitted to make a few prefatory remarks, and would first premise, that the large number of applicants for relief, borne on the face of the accompanying return, cannot fail, I think, to afford abundant and satisfactory evidence of the estimation, in which this valuable Institution is held by the Portuguese and native community in the district of Canara.

The total number of cases treated in the past year, amounted to 3,688, including 3,551 out-door patients, and 137 admitted as house-patients, giving an increase of 1,644, compared with that of the preceding year.

Many most interesting cases, both medical and surgical have come under treatment during the period under review, and while I acknowledge it to be a privilege to myself to have such an institution under my charge, I am glad that it has also afforded me many valuable opportunities of imparting clinical instruction to my friend, native surgeon P. Moonesawmy, and of initiating him in the practical duties of his profession, and which, it is gratifying to add, have on all occasions been most eagerly taken advantage of by him.

I shall proceed now to give a brief detail of the medical history of the dispensary for the past year, according to the rules laid down for the forming of these reports.

Section 1st.—For the information required under this head, I have the honor to refer to such observations, as I shall have to make in my report on the Zillah.

Section 2d.—The only Epidemic which prevailed last year to any extent in this district, was small-pox, but having already gone into some detail on this subject in my "Annual Report on Vaccination," to avoid repetition, I beg leave to refer to it, for the information called for under this head.

Section 3d.—Amongst the house-patients, of whom 137 have been admitted in the past year, being an increase of 73 over the previous year, more than double be it observed, the following classes of disease have most frequently come under observation, "diseases of the stomach and bowels," "dropsies," "rheumatism," and "venereal affections;" of "wounds and injuries" 24 have been admitted, all of them severe cases, and of a very interesting character, some of these will be particulary mentioned under *Section* 4.

Of this class of patients, 14 casualties have occurred, resulting from the following diseases, 2 by dysent. acut. 2 by dysent. chron. 1 by paralysis, 1 by atrophia, 3 by anasarca, 1 by rheumat. chron. 1 by syph. primit. (diarrhœa supervening,) 1 by parturitio, (hysteritis following delivery,) 1 by tumores, and 1 by fracture (occurring in a young man of a very strumous habit of body, and reduced to a skeleton.) The proportion of deaths to admissions being only 10 per cent, a small ratio, considering that most of the cases were admitted in a wretched condition, some labouring under protracted disease, and others suffering from severe wounds and injuries.

Of out-door patients, the total number treated in the past year, amounted to 3,551, being 1,571 in excess of that returned for 1851. The diseases which have been most prevalent amongst this class of patients, have been those of the "stomach and bowels," fevers, rheumatic and venereal affections. Of the first mentioned class of disease, no less than 1,086 have been treated, being about one

third of the whole number that have received medical aid, this however is not a large proportion, considering that under this head, "obstipatio and dyspepsia" are included; next in frequency have been "fevers," of which 837 are entered in the accompanying return, of rheumatism 197, of venereal affections 76, of diseases of the lungs 82, of those of the brain 52, of those of the liver 26, of dropsies 22, and of diseases of the skin 304. Of surgical diseases that have come under observation, the following form the largest entries in the return. Of "wounds and injuries" 172, "abscesses and ulcers" 289, eye affections 86, and under the miscellaneous head of "other diseases" 316.

Of the out-patients treated in the past year, 7 cases are reported to have proved fatal, it is to be presumed however, that out of such a large number as 3,551, that have received medical aid, other casualties must have occurred though not made known to me, the 7 that have been reported, were occasioned as follows, 1 by dysent. acut., 1 by cholera 1 by hepatitis acut., 1 by hydrophobia, 1 by hœmatemesis, and 2 by ischuria, (coma supervening.)

Fevers.—Of this class, intermittent fever has constituted by far the largest proportion of those treated in the past year, the quotidian type being the most frequent; these cases have been generally of a mild character, and yielded readily to the usual mode of treatment namely emetics, purgatives, diaphoretics, bark or quinine, and tonics; not so however with remittent fever which prevailed more than usual in the month of August; the cases for the most part were of the low typhoid type, and several of them of a malignant character, attended with patechiæ and hœmorrhage from the bowels. The plan of treatment found most successful in this form of fever, was bringing the patient as soon as possible under the influence of mercury, this generally had the effect of relieving all the

symptoms, and restoring the secretions as soon as the mouth became affected. Along with this, diaphoretics and purgatives were had recourse to, and latterly tonics, including wine, claret being that which was preferred; in those cases where hœmorrhage from the bowels was present, marked benefit attended the use of turpentine given in doses of from 3 to 5 drops with mucilage every hour or half hour according to the urgency of the symptoms.

While on the subject of fever, I have to state, that in the latter months of the year, margosa bark powder was substituted for that of cinchona, with the view to testing its properties as an antiperiodic, and I have the satisfaction to report, that it was found to answer remarkably well, it was generally preferred by the patients themselves, as being less nauseous, and because it was found to produce a more rapid and decided impression upon the disease; it was usually given in drachm doses, repeated every 4 or 6 hours, until the fever was entirely subdued. The margosa tree is very scarce on this coast, but I was fortunate enough to procure one of a large size, the bark of which I have had dried and preserved for further trial.

Dysentery.—Most of these cases occurred in children, who were early brought by their parents to the Dispensary for treatment, which consisted chiefly in giving powders of pulv. creta comp. cum. opio, hydrarg. cum creta, and pulv. acaciæ, with occasional doses of castor oil. In adults the treatment comprised pills of pil. hydrarg, pulv. ipecac. and opium every 3 or 4 hours until the secretions assumed a healthy character, with doses of castor oil every 2d or 3d morning, this was found sufficient in most cases, but in those of a severe nature, it was necessary in addition to have recourse to local depletion by means of leeches to the abdomen and round the anus.

Diarrhœa.—80 cases have come under treatment during the past year, in many it was attended with œdema of

the legs and feet; the treatment pursued, was in giving pulv. doveri. with grey powder, 4 grains of each every 4 hours, and occasional doses of Gregory's powder, this was usually followed up with fish liver oil, or infus. gentian with soda.

Anasarca.—This disease is very frequently met with at this station, and is usually either consequent upon protracted attacks of fevers, or chronic bowel complaints, it is characterized by œdema of the feet and legs and general puffiness of the face and body, the urine is secreted in small quantity and high coloured, and frequently there is a relaxed state of the bowels; in these cases, it is necessary first to subdue the diarrhœa by giving chalk mixture with catechu or kino, and afterwards directing the treatment to the kidney, with the view of inducing an increased action of these organs; this was done by using a diuritic mixture, consisting of spt. Æther nit. tinct. scillæ, and potass. acetas, along with diluents, such as linseed tea or barley water; fish liver oil has also been given largely in this affection, and found very efficacious. In cases that proved fatal, death was caused by effusion in the thoracic cavity, particularly into the pericardium.

Rheumatism.—197 cases of the acute and chronic forms have been treated during the year, many of the latter were of a syphilitic origin, and proved most intractable, two medicines were chiefly relied on in the treatment of this affection, namely colchicum and potassæ iodid, the former was given usually in powder combined with pulv. ipecac. comp. and the latter with the compound decoction of sarza; this in most cases was found successful; in the acute form however, leeches, fomentations with marsh mallow, tamarind, and margosa leaves were also had recourse to, and in those cases where there was enlargement of any of the principal joints. In chronic rheumatism much benefit was derived from fish liver fat, being well rubbed

in morning and evening; this ointment had the effect of soothing the pain and reducing the swelling. Electro magnetism has also been applied in many of the cases with marked benefit.

In cases of atrophia, diabetes and scrophula, fish liver oil has been largely given, and attended with an amount of benefit truly surprising. Of its virtues, there can be no question. It appears however to be most useful in those cases, where there is great atony of the system, and is therefore a most valuable remedial agent in the treatment of the above named diseases.

Fractura.—12 cases of fractura have been under treatment, including 4 of the ulna and radius, 2 of the tibia and fibula, 1 of the clavicle, 2 of the humerus, 1 of the middle metacarpal bone of the right hand, 1 of the tibia, and 1 of the femur; all of them were easily adjusted and recovered, with the exception of the last mentioned case, which occurred in a young man, of a very strumous habit of body, and reduced to a perfect skeleton, who rapidly sank after admission into the dispensary; amputation in this case was quite out of the question.

Luxatio.—3 Dislocations occurred in the past year, 1 of the shoulder joint, forwards on the pectoral muscles, 1 of the shoulder joint, downwards into the axilla, and 1 of hip joint, upwards and backwards, on the dorsum of the ilium, the first was reduced with ease, the two others by means of pullies.

The following is a list of the operations in the past year, most of which were performed by native surgeon P. Moonesawmy.

1 *Amputation,* of the leg below the knee for extensive disease of the ankle joint, discharged cured.

2 *Fistula in Ano,* operated on and cured.

3 *Carcinomatous Tumours,* removed and cured.

1 *Polypus Nasi,* extracted and cured.

7 *Cases of Circumcision,* discharged cured.

1 *Tumour,* of a cartilaginous nature, situated on the top of the ear, removed and cured.

Section 4th.—Under this head there are 6 cases which I wish specially to notice, all of them in my opinion, possessing sufficient interest to be recorded in this report.

Case 1st.—Necrosis, Edanah Mopla, aged 25, admitted 1st February with extensive disease of the right ankle joint, and considerable shortening of the leg, of one year's standing, occasioned by a fall from a tree, the feet very much swollen and studded with numerous sinuses, the discharge sanious, and characteristic of diseased bone; there was no alternative in this case, but to have recourse to amputation, which was performed on the 6th of the same month, by assistant surgeon Jalland of the 27th Regiment N. I., the leg was removed three inches below the knee, and the case progressed favourably. He was discharged cured on the 29th April with an admirable stump.

Case 2d.—Cancrum oris, Pockray Mopla, aged 15, admitted 1st March with a spreading ulcer of the left side of the face, involving the nose, left portion of the upper lip, and nearly the whole of the corresponding cheek, presenting altogether a most hideous appearance; the disease by his own account, first made its appearance in 1849, in the form of a pustule on the nose, and it has gradually increased; a perfect cure was affected by the external and internal use of potass iodid, with a generous diet, a lotion of this salt, commencing first with 40 grains to an ounce of water, which was afterwards increased to 60 grains was kept constantly applied to the ulcerated surface, and in combination with the compound decoction of sarza, the same salt was given internally to the extent of 6 grains

daily. By the 3d April, the disease was entirely arrested, and cicatrization complete, when he was discharged cured.

Case 3d.—Vulnus incisum, Ambody, Hindoo, aged 28, admitted 13th May for a severe punctured wound in the upper part of the abdomen, inflicted with a straight knife four days before he entered the dispensary, through which a portion of omentum of the size of a lime protruded, of a greenish tint, and much constricted; high inflammatory action, indicated by a strong bounding pulse, with great tenderness extending over the whole surface of the abdomen, and aggravated on pressure. Bowels not opened since the receipt of the injury; on the 5th day after admission, a large, deep abscess was discovered to have formed just below the wound. The treatment pursued in this case, consisted first in subduing the inflammation by leeching largely, giving calomel and opium, laxatives, and emollient enemata; the visceral protrusion was removed on the 5th day by ligature, the case subsequently was treated simply with occasional laxatives, alteratives and tonics, and the patient was discharged well on the 9th June.

Case 4th.—Carcinoma, Thimmapah, Hindoo, aged 40, admitted 16th May for a carcinomatous affection of the penis, involving the whole of the prepuce, and part of the glans, of several years standing; urine passed only in drops through several orifices in the diseased mass; I first determined to amputate the member, but taking into consideration the duration of the disease, its malignant character, and the age of the patient, I deemed it more prudent simply to remove the pressure, and as much of the diseased glans as possible, which was done the same day he was admitted, the patient having first been placed under the influence of chloroform. The after treatment consisted in the application of a lotion of potassæ iodid. half drachm to an ounce of water, which had the effect

of completely arresting the further progress of the disease. He was discharged cured, on the 3d July, and has not since returned to the dispensary, which he certainly would have done, had the disease broken out afresh.

Case 5th.—Bronchitis chronic, F. Berkley, Indo Briton, aged 36, admitted 24th March with a most harassing cough, accompanied by copious expectoration, of a muco purulent character, pain over the upper part of the chest, and a sense of tightness, at times very distressing; vesicular murmur faint, sibilant râle, night sweats, particularly towards morning, sunken eyes, great emaciation, pulse quick and feeble, tongue furred, bowels regular. Empl. vesicat. 6 by 5, to the chest, fish liver oil two drachms, three times a day, morphia hydrochloras one grain, camphor mixture one ounce at bed time.

26th March,—Cough easier, expectoration copious, and still muco purulent, resonance over the upper part of the right side, pulse not so quick; fish liver oil three drachms, three times a day, cont. anodyne draught.

30th March,—Decidedly better, cough less, expectoration diminished, and consisting now only of mucus, appetite improving, pulse fallen in frequency and firmer, bowels open, picking up flesh; continue fish liver oil, half ounce three times a day, generous diet.

7th April,—Is quite well, and has gained several pounds in weight, discharged cured, but recommended to continue the oil for some time.

Case 6th.—Atrophia, Lawrence, a native christian boy aged 9, admitted 23d July under the head of atrophia, but suffering also from symptoms of incipient hydrocephalus, great emaciation, partially comatose, head generally enlarged, more particularly the front, and required to be supported, when he sits up in the cot; pupils dilated, frequently sighs and moans, urine scanty, bowels cos-

tive, no appetite; little or no hope entertained of his recovery; treatment, calomel and James's powder was first given, with occasional doses of rhubarb and magnesia, then a diuretic mixture, containing only spt. Æther nitri and liq. ammon acetat, and a small blister applied to the scalp; this treatment was continued for about 10 days, after which, fish liver oil was given in half drachm doses every 4 hours, gradually increased to two drachms, the oil agreed so well with him, that from the time he first began to take it, he rapidly picked up flesh and was discharged cured, on the 10th September.

The beneficial effects of the oil were strikingly marked in this case, the child left hospital fat and plump, scarcely to be recognised as the same boy.

In concluding this report I have only to add, that the expense incurred by Government in the past year for the dieting of pauper patients, amounted to Rupees 214-2-8. This item of annual expenditure Government will I hope be relieved from in future, as two funds were raised a few months ago in aid of this institution, one through an appeal addressed by me to the European residents of the station, and the other by a separate appeal made by the native surgeon to the native inhabitants, both of which are supported by monthly subscriptions, averaging respectively 45 and 22 Rupees a month. The objects to which the former are applied, are, relieving the wants of the more indigent class of patients in the way of clothing and procuring such medicines as arsenite of quinine, valerianate of zinc, &c. which are not supplied to native hospitals. The latter is to defray the expense of dieting the pauper patients, and will take effect from the commencement of this year.

2d Dresser Iyaloo, No. 100 attached to the dispensary is most constant in his attendance, and diligent in the performance of his duties.

Memorandum.

1852.	Number of Paupers diated during the year.	Average Cost for each Pauper per month.			Amount.		
January, - - - - -	11	1	6	$1\frac{54\frac{1}{2}}{100}$	15	3	5
February, - - - - -	11	1	10	$3\frac{36\frac{1}{4}}{100}$	18	1	1
March, - - - - -	10	1	7	$1\frac{40}{100}$	14	7	4
April, - - - - -	8	1	15	$8\frac{75}{100}$	15	13	10
May, - - - - - -	7	1	2	$7\frac{14}{100}$	8	4	6
June, - - - - -	3	1	15	4	5	14	0
July, - - - - - -	18	1	1	$6\frac{77\frac{3}{4}}{100}$	19	12	2
August, - - - - -	16	1	5	$\frac{38}{100}$	21	5	6
September, - - - -	14	1	1	$11\frac{28\frac{1}{2}}{100}$	15	11	2
October, - - - - -	14	1	12	$11\frac{28\frac{1}{2}}{100}$	25	5	2
November, - - - -	19	1	8	$6\frac{63}{100}$	29	2	6
December, - - - -	18	1	6	4	25	2	0
				Total Rupees...	214	2	8

MANGALORE, 1st *January*, 1853. } D. D. FOULIS, M. D. *Zillah Surgeon.*

ANNUAL MEDICAL REPORT OF THE CIVIL DISPENSARY AT MANGALORE FOR THE YEAR 1851.

This valuable institution continues to be duly appreciated by the Portuguese and native community in and around Mangalore.

The new dispensary being so far completed, as to admit of its being occupied, the house patients, medicines &c., were removed to it from the temporary building on the 31st ultimo.

The only work left to be done, is the erection of the compound wall and the construction of a well. In the meanwhile, the compound is enclosed partly by a mud wall, and partly by a bamboo fence, and good water is procured from a tank near at hand.

Its situation is centrical, and in close proximity to the town and bazaar. The building stands north and south, facing the sea, and lies to the north of the parade ground, but separated from it by the public road. The space of ground it occupies is rather irregular, as will be seen by the plan, measuring about 280 feet in length, by 170 feet in breadth.

The building which is raised 3 feet from the ground, and well ventilated, consists of 2 male, and 2 female wards, a receiving room, an operating room, a dispensing room, and a store room, there is a large verandah in front, and a smaller one at each end. The operating room is very well lighted, principally from above, by means of a sky-light, which was specially applied for by me as essentially necessary for the performance of operations; particularly during the monsoon, when the weather is so very cloudy, that were it not for a provision of this kind, the room would be inconveniently dark. There are two bath rooms, one for the male, the other for the female patients, placed behind, at each corner of the building, about 25 paces from the hospital, and to the right of it, are situated the cook-rooms, two in number, but under the same roof; one of these being sufficient for the use of the patients, the other serves as a convenient place for the preparation of fish liver oil. On each side of the cook-rooms and about 20 paces distant, are placed the privies, two in number occupying the corners of the compound.

The number of applicants for relief during the period under observation, as shewn by the accompanying return

amounted to 2044 including both in and out-door patients, being 102 in excess of the number treated in 1850.

The cases generally have been of a more interesting nature, than those that presented themselves the previous year, particularly so with regard to surgical cases. The attendance on the part of the out-door patients has been very regular throughout the year, few having absented themselves previous to their complete recovery, and the house patients seemed to appreciate the care and attention bestowed on them.

Out patients.—Of this class 49 remained under treatment on the 31st December 1850, 1980 have applied for medical aid during the year, making the total number of cases treated 2029, of these 1884 were cured, 85 relieved, 30 no better, nine died; and 21 remain still under treatment, average number of sick 34.

It will be seen by a reference to the annual return, that the column marked "absented" has been left blank, this I have been unable to fill up, in consequence of there being no corresponding column in the monthly returns, were I to enter the number of these who absconded, the general total would exceed the number of cases actually treated. I have been compelled therefore to include them in the number of those returned "relieved" and "no better" which accounts for the large number entered under these heads.

The diseases which principally came under observation were those of the "stomach and bowels," of the "lungs," and of the "skin," but fevers, rheumatic and venereal affections also constituted a considerable number of the cases.

Amongst the out-patients 9 deaths have occurred during the year, 2 from febris intermittens, 1 from enteritis, 1 from dysent. chron, 1 from cholera epidemic, 1 from apoplexia, 2 from anasarca, and 1 from phlegmon and abscess

In-patients.—Remaining on the 31st December 1850, 4, admitted 64, total number of cases treated 68, of these 36 were cured, 19 relieved, 1 no better, 8 died, and 4 are still under treatment, average number of sick 4⅓.

In order that Government may be put to as little expense as possible in the dieting of the sick, I must here observe in explanation of the comparatively large number of cases returned as "relieved," that I am in the practice of transferring those of the house patients, suffering from chronic disease to out-door patients, as soon as they are well enough to go out of hospital, such cases are therefore strictly entered as relieved.

Many patients were admitted in a most deplorable state of suffering from long protracted disease, and greatly emaciated, this was particularly the case with those who suffered from anasarca, ulcers, rheumatic, and syphilitic affections, in these cases fish liver oil was found most beneficial, given in doses, varying from 1 to 4 drachms, three times a day; from its use, several patients left hospital quite fat, and in good condition. As most medical men are prepossessed in favor of the pale coloured oil, I think it right here to remark, that I have found the dark kind equally efficacious and am even inclined to give it the preference.

The proportion of deaths to treated amongst the in-patients during the year, has been rather large, being 1 in 8, but considering the very serious nature of the affections under which most of these laboured, the result could not well have been otherwise; as before stated 8 deaths have occurred, 1 from febris quot. int. 1 from catarah. chronic, 1 from dysent. acut. 1 from diarrhœa, 1 from anasarca, 1 from rheumat. chron. 1 from vulnus incisum, and 1 from morbus coxarius.

Subjoined is a list of the operations performed during the year. In most of these, I was ably assisted by Dr.

Brett of the 35th Regiment N. I., who was always ready on such occasions to proffer me his kind services. Seven of the cases were operated on while under the influence of chloroform.

Date of admission.	Names.	Age	Diseases.	Operation.	Operation performed by whom.	Results.
5th Jan. 1851.	Seva. Row,	35	Tumor encysted, on the left upper eye-lid.	Extirpated.	Dr. Foulis	Cured.
15th Mar. ,,	Moondah,	1½ 26	Congenital Cataract.	Couched both eyes.	Dr. Brett	Cured.
10th May. ,,	P. D'Santoo		Tumor, encysted, situated at the outer angle of the right eye.	Extirpated.	Dr. Brett	Cured.
28th Aug. ,,	Pootoo,	40	Tumor, fibro, cartilaginous on the left lower eye-lid.	Extirpated.	Dr. Foulis	Cured.
1st Oct. ,,	Poovapah,	22	Fistula in Ano.	Operated.	Dr. Foulis	Cured.
14th ,, ,,	Doomah,	44	Cataract.	Couched both eyes.	Dr. Brett and Dr. Foulis	Relieved.
17th ,, ,,	Pedro,	40	Schirrous, tumor on the lower-lip.	Extirpated.	Dr. Foulis	Cured.
4th Nov. ,,	Annapah,	25	Vulnus incisum, from a large Shark hook embedded in the right leg.	Removed.	Dr. Foulis	Cured.
10th ,, ,,	Xavier,	53	Gangrene, Supervening on a snake bite,	Amputation of the thigh at its middle.	Dr. Foulis	Still under treatment but the stump is healed.
15th ,, ,,	Ryman Saib	48	Contusion, Laceration of the middle finger of left hand.	Finger Amputated removing head of metacarpal bone.	2d Dresser Appiah	Cured.
15th ,, ,,	Batiah,	25	Phymosis.	Circumcised	Dr. Foulis	Cured.

2d dresser Appiah, No. 150, continued to give me entire satisfaction up to the time he was removed for regimental duty, in two cases of arm presentation, he performed the operation of turning; in the first case, under my directions, the second he managed entirely himself. The fœtus in both however had been dead for some hours, before the patients were brought to hospital. The mothers made a good recovery.

Memorandum.

1851.	Number of Paupers dieted during the year.	Average cost for each Pauper for one Month			Amount.			Total.		
January, - - - -	3	1	3	$10\frac{1}{3}$	3	11	7			
February, - - -	1	0	15	5	0	15	5			
March, - - - -	6	1	5	$\frac{1}{3}$	7	14	2			
April, - - - -	8	1	5	$1\frac{62\frac{1}{2}}{100}$	10	9	1			
May, - - - -	6	1	11	$6\frac{1}{2}$	10	5	3			
June, - - - -	6	1	15	$3\frac{16\frac{1}{2}}{100}$	11	11	7			
July, - - - -	11	1	13	$1\frac{9}{100}$	20	0	0			
August, - - -	8	1	2	$9\frac{37\frac{1}{2}}{100}$	9	6	3			
September, - - -	9	1	11	$11\frac{89}{100}$	15	11	11			
October, - - -	6	1	2	6	6	15	0			
November, - - -	8	1	13	$6\frac{37\frac{1}{2}}{100}$	14	12	3			
December, - - -	7	1	12	$10\frac{85\frac{1}{2}}{100}$	12	10	4			
	79	Total Compy.'s Rupees...						124	10	10

MANGALORE,
1*st January,* 1852.

D. D. FOULIS, M. D.
Zillah Surgeon.

1850.

Civil Hospital and Dispensary, Calicut.

MISCELLANEOUS OBSERVATIONS WITH REFERENCE TO THE ANNUAL RETURN OF SICK.

Having been in medical charge of the institution since March last, and that period interrupted by two journies to Madras on duty, I am unable to give such a connected history of its annual practice as I could have wished,

but in proof that the charity has been as much resorted to, during the period embraced by this report as in former years, I have only to refer to the returns, which shew the number of out-patients treated during the year, viz., 1462, being an increase of 160 over the previous year, and of in-patients 126 being an increase of 34. There appears to be every confidence placed by all classes in European treatment, who in every case of severe injury, wounds, fractures, &c., instantly resort to this hospital and some from considerable distances.

During the last three months, I have been in correspondence with the Collector, with the view of procuring if possible a more suitable building in the heart of the town and of opening venereal and lying-in wards, both of which (particularly the former) I believe to be much needed.

The majority of the in-patients are so wretchedly poor, that when admitted they have often scarcely a rag to cover them, the consequence is, they use the hospital quilts which soon get worn out, it is therefore very desirable that a certain number of cloths be supplied every half year as clothing.

The prevailing diseases treated during the past year amongst the out-patients have been under the heads of "diseases of the stomach and bowels," which includes 152 cases of vermes, "fevers" 133, "ulcers" 78, "psora" 57; regarding their treatment I have nothing worthy of remark, the cases of fever have generally speaking been of a very slight nature, requiring only an emetic and purgative. Fevers of the intermitting type were rare during the year. Intestinal worms are very common here, an extraordinary number generally the lumbrici being passed; one man who had been prescribed an emetic for slight fever and derangement of the stomach vomited up-

wards of 50! and few bodies are opened without finding the small intestines full of them. In making a post mortem examination of the body of a jail prisoner who expired suddenly while at work, the small intestines felt quite full of them and between 50 and 60 were removed from the canal. When known to exist they rarely withstand the oleum terebinthinæ, or a dose of calomel combined with scammony and jalap. The tape worm is not so common. Psora in all its forms is rife here, very few appear on the returns as receiving treatment and I may in this remark include ulcers. The reason of this so far as I can learn is, the natives care little about having the former disease, being so common amongst them, few are free from it, and when in its worst form and running into sores in the lowest classes, they prefer so to remain, to being cured, wandering about the town the objects of, and subsisting on, charity, seeking refuge at nights in the verandahs of empty houses or in a poor's house built for that purpose; many of these have been received into hospital in almost a helpless condition, some to recover only to go out again, re-establish their sores and commence afresh their wandering habits; several have been recommended to lose their limbs for incurable ulcers and necrosis fast undermining their lives, but prefer remaining as they are, I presume, fearing if they were cured, their occupation would be gone. Of such cases, the hospital could any day be filled and kept so the year round.

With the exception of an out-break of small pox in May and June, and cholera in July and August, I may say the town of Calicut has been tolerably healthy; only four deaths are known to have occurred amongst the out-patients while receiving medicines from the hospital, viz., one from febris continua communis, one from variola, one apoplexia and one anasarca. The first only requires

a remark, she was the wife of a respectable inhabitant of this town and in good circumstances, of a very bad habit of body and very stout, she died on the 11th day after being confined of her first child from puerperal fever ; native treatment was resorted to both at the commencement and end of the disease, as well as during its progress, she was obstinately kept in a very small confined and hot room and allowed to see many visitors. Leeches, were applied, counter-irritation, hot turpentine to abdomen ; calomel and Dover's powder, salines (antimonial) hot baths, &c. &c., (at least these were prescribed for her) but without effect. I have seen more obstinacy amongst this class of patients who ought to know better, than amongst the poor. A very large proportion of the out-patients have been amongst the Portuguese and half cast population, living around the dispensary, some of them employed in the public offices and others not, who with their families have been attended by the dresser, which arrangement was permitted by my predecessor, and with which I do not interfere so long as it does not prevent his own especial duties and attendance in the hospital.

The principal diseases amongst the in-patients have been vulnus incisum 18, variola 16, ulcers 15, anasarca 11, fractura 7.

Most of the cases of wounding were of a severe character and sent by the police, the practice which obtains in this district of permitting nearly every man to wear a knife is a fruitful source of these kinds of injury, and of course amongst an irascible people like the moplas, with a sharp weapon at hand, murder is very common, which it would not be, were the population disarmed. All this class of wounds heal very kindly and rapidly under the ordinary treatment ; but I will mention a few cases as examples. A healthy young woman was admitted on the 15th April last with a large

wound about six inches in length across the loins, about the 10th and 11th dorsal vertebræ, dividing part of the latissimus dorsi muscle, the wound gaping much, and from it much hœmorrhage had taken place; she had received seven other smaller wounds, one of which appeared to be a stab and fractured the spinous process of the 2d or 3d dorsal vertebræ and another which sliced off the humeral end of the clavicle all of which were inflicted by her husband; she was doing very well under the ordinary treatment, when she took small pox, the edges of the wounds took on a sloughy action, pustules being observed upon them, and although she was very ill requiring the free use of carbonate of ammonia, aromatic confection and latterly quinine and port-wine, the sores got well under the use of warm dressing, &c., and she was discharged cured on the 20th May. Another female, sister of the above patient, received from the same hand and on the same day, a large wound on the palmar side of the fore-arm dividing the whole of the superficial layer of flexor muscles, she got small pox on the same day as her sister, did well, and was discharged on the 18th of May.

A mopla aged 30, admitted August 19th at 4 P. M. with an incised wound on the left arm of the shape of the letter V inverted, its apex being at the insertion of the deltoid muscle, caused by a knife about 7, A. M., the wound was about four inches in length on each side and right down to the bone on its inner side; there had been profuse hœmorrhage and a troublesome branch of the circumflex artery required ligature, he did well and was discharged on the 12th September. Another man, a tier by caste, admitted at the same time as the last case and wounded by him, had received nearly a similar wound on the corresponding arm, half the deltoid was divided a little below its middle as well as some fibres

of the biceps, the wound was very deep towards the inner side and close to the artery which could be felt pulsating under the finger; he was very much collapsed from the hœmorrhage which had been profuse; a muscular branch required ligature; he did well and was discharged on the 20th September. Other cases very similar to the above might be detailed, but these may suffice to show the nature and sometimes severe character of the wounds which present at this institution.

One death occurred under this head, it was the case of a Peon who was stabbed last month, without apparent provocation by an old mopla about 8 o'clock one morning, and was brought a distance of some 30 miles about the same hour the day following, with two feet of the ilium and a portion of mesentery protruding from an opening 1½ inches in length and about the same distance to the right of the umbilicus, with a wound through half the diameter of the bowel; its convolutions had become glued together and had to be gently broken down, and a couple of interrupted sutures with fine silk closing the edges of the wound of the bowel, before reduction was attempted; the pressure on the inflamed and thickened gut gave him much pain and the abdominal muscles were put so much on the stretch, that I made him inhale thirty drops of chloroform, which had the desired effect; the whole of the protrusion being returned, a good deal of black fluid-blood escaped from the opening which was closed by means of suture, with compress and bandage over; he had a good deal of tenderness of the abdomen, his pulse was very small and feeble and his extremities cold, and he gradually sunk and expired at 10 P. M. On examination the following morning another wound of the bowel was discovered which had not protruded, through which feculent matter had escaped; a clot of blood was found on the right side, a good deal of serum effused

and every mark of extensive inflammation, the internal epigastric artery had been divided and the sheath of the rectus contained a large clot.

Another case similar to the above, but attended with a different result took place under the head of vulnus incisum, an old mopla woman aged 70, being gored by a bullock about two hours before admission received a wound of a triangular shape in the right side of abdomen about four inches breadth from the crest of the ilium, through which protruded about 2½ feet of the ilium; the bowel was readily reduced; an opiate given followed by castor oil the day after; no inflammation supervened, and though she left hospital after eight days to go to her home, she is now going about the streets quite well.

Sixteen cases of variola have been admitted during the last year, seven cured, eight died, and one remaining under treatment, nearly the whole of these cases were sent in by the police authorities having been either found lying about the roads are abandoned by their friends, for it is said to be the custom, when any member of a family is attacked with this disease, for the rest to quit the house, leaving the sick person in charge of some old woman, and sometime without even that attendance; of course these cases were in a very hopeless condition and little could be done for them; purgatives were seldom or ever required, the bowels being very regular and in some cases relaxed; when the eruption did not fill well, with much swelling of the head and face, pulse small and frequent, extremities cold with occasional delirium, an unfavorable prognosis was generally formed and all these cases proved fatal in spite of ammonia, camphor, aromatic confection, œther, nourishing diet and a liberal allowance of wine; but when the disease was got under treatment early, and not of a malignant kind, the pustules distinct and filling

well, they rarely required any treatment until the decline of the disease, when a stimulant and tonic mixture was had recourse to with the best results.

Under the head of "ulcus," one death occurred from diarrhœa, many of the cases of ulcer admitted into hospital were in the persons of poor wretched paupers, numbers of whom get a precarious living by begging and who occasionally apply for admission more for the sake of being provided for, than with the view of being cured as I have before mentioned. Several cases of obstinate ulcer called "malabar ulcer" have shown themselves and have proved most intractable, every mode of treatment both generally and locally has been tried in succession, but with little success; they were all of old standing and in general amongst the very poorest inhabitants, of a circular form, with large pale granulations, rising above the surrounding integument, with jagged, red, angry edges; very little pain accompanies it, discharging a copious, thin, reddish and at times bloody matter; one part of the sore would put on a healthy aspect and cicatrization commence, while at another part the ulcer was spreading; the treatment most useful has been turpentine internally in doses of 30 drops thrice a day, with careful strapping and bandaging but they are very obstinate and require a long course of treatment for their cure.

Two deaths from remittent fever, neither require further notice than the remark, that both were brought into the hospital in the last stage of the disease having contracted fever in the jungle in the neighbourhood of Paulghaut. Under the head of "phlegmon et abscessus" two deaths are recorded both occurred during the incumbency of my predecessor, one is stated to have sunk from chronic dysentery, the other was a 2d class patient admitted with a very large abscess extending from the lumbar region over the right nates involving the whole thigh to near the

knee, depending openings were made which gave exit to unhealthy pus and sloughs, but he sank under the constitutional disturbance. Seven cases of fracture presented, six of which were cured and one died. The first admitted last January under Dr. Buchanan was a compound fracture of the left thigh, with simple fractures of both forearms, in the person of a boy of about 12 years of age, he was treated by the Dresser and was discharged cured; the boy was shewn to the Superintending surgeon at his annual inspection and he pronounced the appearance of the limb to be most satisfactory and creditable. The 2d case was a fracture of the ulna and radius in two places of the right forearm which did well. The 3d a fracture of the right humerus about the middle which also did well, in a boy about 9 years old. The 4th case a fracture of the left thigh in a young man, occasioned by a fall from a tree, he left the hospital before he was quite cured and with the leg a little shorter than the other, owing entirely to his own obstinacy, for though continually warned and watched, he could not be prevented from undoing the bandages which secured the long splint and when put on the double inclined plane, he did the same thing. The 5th case occurred in the person of a very old woman who from falling down a well on the 18th of April last, sustained a fracture of both bones of the right forearm three inches above the wrist, an oblique compound fracture of the right tibia near the ankle joint; the arm was adjusted in splints as also the leg, the bones of the latter being reduced, the integuments brought together by a couple of sutures and cold water applied; gangrene however ensued, when amputation was immediately resorted to, the poor old creature was nothing but skin and bone, and she was very unwilling to part with her limb, but after a little entreaty she consented. The circular mode was adopted a few inches below the head of the tibia, she bore it

well, lost little blood and ultimately recovered, though the stump was long in healing and she required the liberal use of tonics, wine and nourishing diet. The fractured radius and ulna however formed no bony union, but she was using the arm very well when she left the hospital on the 31st May. The 6th case was another of fracture and requiring immediate amputation, it occurred in a boy aged 12 years, admitted April 22d at 4½ P. M., having sustained by a fall from a tree a compound dislocation of the right humerus at the elbow joint, parts of the condyles being broken off, a compound dislocation of the right radius at the wrist, and a fracture of the ulna near the carpal extremity; there was much laceration of the soft parts both at the elbow and wrist. Amputation of the arm about its middle was resorted to by the circular method, and though some fever occurred on the 3d day and an abscess on the face of the stump on the 5th, he did well and was discharged, cured on the 20th May.

The 7th case was in the person of a stout man aged 30 who fell from a cocoanut tree at 6 P. M. on the 8th and admitted at 3 P. M. on the 9th of April, with a compound dislocation of the carpal extremity of the ulna, which protruded about ½ an inch, a little of the articular surface being broken off, with extensive laceration of the soft parts on the carpal side of the wrist and distortion, the carpus being a little thrown back upon the radius, there was considerable swelling of the parts from the length of time since the accident occurred; the parts being well cleansed, reduction was accomplished, three interrupted sutures, and a bandage kept constantly wet was applied and a purgative given; there was some pain in left thigh and in the loins, but no fracture. On the 11th some diffuse inflammation came on, all bandages were removed, the parts fomented, poulticed and the arm laid on a pillow, and every thing was done to reduce

the inflammation, as leeches, antimonial salines, calomel and Dover's powder, purgatives, opiates at night; the following day vesications appeared, the arm was much swollen up to the axilla and pitted on pressure, pulse 100 small and jerky, discharge became very offensive and mixed with air; carbonate of ammonia, camphor, Dover's powder, quinine and opium, port wine, &c. were now resorted to, with charcoal and toddy poultices and solution of chloride of lime externally, free openings were also made along the arm in various parts, which gave exit to fœtid pus and black sloughs, delirium came on, a large quantity of fluid putrid blood was discharged from the arm and he sunk and died on the 18th, nine days after admission. On examination there was found a comminuted fracture of the end of the radius, with some spiculæ of bone projecting into the joint; of course had this been known no attempt to save the limb would have been thought of, but the parts were so much swollen and painful that the examination was a difficult one and during the rapid progress of the gangrene no opportunity was afforded for removing the limb though it was anxiously looked for.

In nearly all the cases of fracture the gutta percha has been used as splints, being kept ready cleaned, and rolled out into sheets of the necessary thickness. In simple fractures it answers very well, is quickly applied and economical, but in compound fractures, from the little experience I have had of it, I cannot speak so favorably, though made of what was considered a sufficient thickness and previous to application moulded to the shape of the limb while warm, it appeared rather to contract than expand as it cooled, causing unequal and injurious pressure, and with the heat of the body, the climate and the warm water used in cleansing the parts from the discharges it became soft and yielded, causing distortion.

One death under the head of parturitio occurred in a poor woman with a very large curvature of the spine (posteriorly) she was brought to the hospital in the evening complaining of not having made water for four days; after a little difficulty in the introduction of the catheter it was drawn off; next morning her abdomen was observed much distended, and although she declared that it was impossible, it was evident she had a gravid uterus; as no account could be got from her or her friends, except that for a year her size had been large, an examination per vaginam was made, and the scalp of a fœtus in an almost putrid state, found presenting at the external parts; the body of a child could distinctly be felt through the abdominal and uterine parietes and much fluid in the abdominal cavity; the outlet of the pelvis being so much contracted that the forceps could not be applied delivery was at once proceeded with, by the perforator and accomplished without either pain or hæmorrhage; no uterine action took place and the placenta was removed by the hand in a putrid form; no contraction followed and on withdrawing the hand a large rent was discovered in the posterior part of the vagina close to the os uteri, through which on pressing the abdomen fluid in large quantity flowed; the woman sank and expired without any pain eight hours after delivery. On post mortem examination a large quantity of fluid was found in the abdominal cavity, and it is supposed the rent in the vagina was caused by the uterus violently acting on its contents while the head of the child was impacted in the outlet of the pelvis; how the poor creature could have borne her sufferings without having given vent to her feelings is a mystery; her friends till shown the child, obstinately persisted in their statement that she was not pregnant.

The two amputations that were necessary during the past year, were performed by the dresser in my pre-

sence, with skill and coolness, eight cases of fractures were reduced and treated by him; tumors, and numerous polypi removed with other minor operations, he is very anxious to keep up the knowledge he already possesses, and reads all the professional works which I put into his hands; I have perfect confidence in him in cases of emergency.

CALICUT,
1st *January*, 1851.

E. J. BARKER,
Civil Surgeon, Malabar.

CIVIL HOSPITAL AND DISPENSARY—CALICUT.

Miscellaneous Observations with Reference to the Annual Return of Sick.

The house used as a civil hospital and dispensary at this station remains in the same state as at last report, but I am happy to say a new building has been commenced and it is expected will be completed before the monsoon. This will meet a great want felt here, viz., separate wards for different caste patients; as it is, and although the past year has been a remarkably healthy one, and without the visitation of any epidemic, the return indicates that there has been an apparent increase of confidence in European treatment. Many of the wealthy classes too have been treated during the year, either at the hospital as out-door patients or at their own houses for wounds and in cases where native treatment had failed.

The number of applicants for aid as out-door patients have been 1,746, with which the 17 remaining at last report makes the total 1,763, being an increase of 301 treated during the period embraced by this report over that of 1850.

113 have been treated as in-door patients, which with the 11 that remained at last report makes a total of 124 treated, being 2 less than in 1850.

The principal diseases treated amongst the out-door patients during the past year have been under the heads of diseases of the stomach and bowels 510, fevers 244, ulcers 129, wounds and injuries 143. Regarding the treatment in the above I have nothing to record worthy of remark, the cases in general being mild in character, of no particular interest, and requiring for their relief merely the ordinary method of treatment.

The principal diseases amongst the in-door patients have occurred under the heads of wounds and injuries 36, abscesses and ulcers 24, venereal affections 11, and fevers 19.

There have been no less than 123 cases of vulnus incisum treated at this hospital, 24 of these having been of a severe character, required admission into hospital. Most of them did well under the usual treatment, others from neglect, in not being brought soon enough to hospital or from their very severe nature had a less fortunate termination. A few of these cases may be mentioned.

1st. "Patormah," aged 30, an apparently healthy Mopla was admitted February 27, 1851 at 7 P. M., having been brought from a distance of 40 miles, she having received two severe wounds in the throat from her husband three days previous. One of these was a long gaping wound about 4½ inches in length immediately above the rima glottis, the other a little longer, about an inch below the former, and inclined to the left side and superficial; the wounds had begun to slough and were very foul and offensive, she was in an extremely feeble state, not having taken any thing since the wounds were inflicted, pulse 128, very small, several attempts were made to introduce a tube into the œsophagus, but so much spasm was excited that it was desisted from for the time, the edges of the wounds were drawn together by suture and dressed, the head brought well down upon the chest and retained in

that position, arrowroot conjee enemata with laudanum administered, but difficulty in breathing increased and she expired 12 hours after admission.

2d. "Itheneooty" aged 2½, admitted 19th July 1851, with a penetrating wound on the left side of the abdomen a little below the centre of the margin of the ribs, through which protruded about two inches of omentum in a blackened and fetid state, he had been stabbed by his father with a knife five days before. The protruding portion of omentum was removed, the wound dressed and the child recovered without a bad symptom and was discharged August 1st; previous to wounding his child the father had killed his wife, for which he was hanged.

3d. "Conmen" aged 40, August 1st 1851, was brought to the hospital this morning having in a quarrel with a man at a ferry been stabbed with a knife on the right side of the chest, the wound penetrating the cavity immediately below the sternal extremity of the clavicle, divided the cartilage of the 1st rib, the intercostal muscles, (a portion of the pectoral muscles being also divided) leaving a large gaping wound about 4 inches in length through which much frothy blood escaped at every inspiration; he was very low and feeble having lost much blood, his pulse almost imperceptible and his respiration short and hurried. After all hœmorrhage had ceased the wound was closed by sutures, cold water dressings and compress and bandage applied, he was ordered to be kept perfectly quiet and an anodyne draught given at night. The following morning he was found much worse, cough had come on in the night, the dressings had moved and there was an escape by the wound of a little bloody-fluid, no bleeding vessel detected, pulse 100, very small and feeble, countenance very anxious and extremities cold, he was removed from the hospital by his friends at his own request and died before reaching home.

4th. "Chattoo" Nair, aged 30, admitted 17 August 1851, in a state of almost complete insensibility, cold, pulseless, and collapsed with two wounds in the abdomen, one near the margin of the ribs on the left side of the epigastrium, at which a portion of omentum presented, another midway between the umbilicus and ensiform cartilage in the mesial line, through which about four feet of the small intestine protruded, the bowel was glued together and partially dried, the wounds having, it was said, been self-inflicted 24 hours before. A stimulant having been administered the gut was carefully returned; but he expired almost immediately afterwards.

5th. "Cherigu Choic" Tier, aged 25, admitted September 11, 1851, at 9 A. M. with an incised wound in the abdominal parietes about four inches long, extending transversely across from the anterior superior spinous process of the ilium on the left side towards the mesial line, and through which protruded 5 or 6 feet of intestine with its mesentery and a portion of the omentum; the convolutions were agglutinated by coagulable lymph and somewhat inflamed; he was stabbed the evening before (in a dispute about a rupee and a half) and has lost a deal of blood, pulse very feeble and small and extremities cold. The intestine was carefully returned, sutures, compress and a bandage applied, but he died at 1, 30 P. M. four hours after admission. It is not in every instance that friends will permit of an examination after death, but in this it was, two small wounds of the ilium were discovered and a large clot of blood in the abdominal cavity; he must have lost a large quantity of blood externally.

6th. "Neelee" a chermee or slave woman, admitted 13th October 1851, at 10 A. M. she was brought in from Koletoor a distance of 40 miles, having been wounded by her husband in a fit of jealousy nine days before. It appeared that he first attacked and killed his child by

cutting off its head (for which he has since suffered the extreme penalty of the law) and then struck at his wife severing her right hand at the wrist joint, from which it was suspended merely by a portion of integument; on the left arm he likewise inflicted another severe wound dividing the whole of the extensor and supinator muscles down to the bone; she lost a large quantity of blood and her wounds were in a very foul state and full of maggots when admitted, but being a young healthy woman, she did well and was discharged on the 14th November. She had an infant at the breast during the above period.

The mother of the above patient was brought to hospital on the same day having been wounded by the same individual. The wound was on the forehead about 4 inches long but not exposing the bone and was soon well.

The above cases have been abstracted from the hospital journal, others, though perhaps not quite of so severe a character might be detailed, but these, and the number of cases of wounding admitted or treated as out-door patients will perhaps be sufficient to prove the frequency of stabbing in this district caused solely, I am persuaded by the habit of every man being armed with a knife, and which it would in my opinion be a charity to the people if government would strictly prohibit.

The cases of wounding treated at this institution form but a moiety of what takes place in the talooks. Numbers of people are sent by the Court for certificates as to the severity of wounds received, some of these being long healed and apparently of considerable severity.

Abscesses and ulcers have been common in the year, a few cases of the former presented in young children of scrophulous habit, the offspring of the very wretched race of chermers, in one case there were as many as 22 abscesses over the body all recovered under the use of

tonics and potassii iodidum with a nourishing diet, latterly the fish oil has been found of use. Of ulcers many were of great extent and very intractable, presenting all the characters of the malabar ulcer as described in a former report. The fish oil has been found most useful as also an external application of two parts of the fat or residuum, obtained in making the oil with one of yellow wax; this cleanses the sore better than anything else I have yet tried, and forms a very economical application.

A few severe cases of fracture have been treated during the year amongst the number I may mention.

1st. "Iswah" a young pariah woman, aged 19, admitted 6th June 1851, with a compound fracture of the right femur about 1½ inches below the trochanter major, occasioned by a fall from a mangoe tree; the fracture was oblique and about 1½ inches of bone found projecting through a laceration in the integument posteriorly; she was six months in the family way, and had also received a severe blow across the loins from a falling branch; reduction of the projecting end of the bone was accomplished and kept so by the use of the long splint, side splints and 18 tailed bandage, a hole being previously cut in the wooden cot, to permit of the wound being dressed. She was a very troublesome patient, nothing would induce her to keep quiet, and she was continually untying the bandages; at last, holes were obliged to be made in her cot, and pieces of cloth being placed round her body were tied underneath it, in this way humouring her as much as practicable, bony union formed and though not quite well she left the Hospital August 19th. It has been ascertained that she has since had a living child.

2nd. Another case of simple oblique fracture of the thigh, about the junction of the middle with its upper third, occurred in the person of "Parion" a tier boy

aged 16, caused by the fall of a heavy piece of timber which he was assisting to carry; this case however requires no further remark than that it was successfully treated by means of the long splint.

3rd. A case of compound fracture of the right tibia occurred in the person of an old man "Patcheeooty" said to be 50; but his appearance would indicate 60 years of age at least, who fell from a wall upon a piece of wood; the fracture was direct, immediately below the tubercle of the tibia with a wound of the soft parts a little lower down. It was treated by keeping the limb extended upon pillows until the wound was healed, when splints were applied; bony union had not formed after 20 days; the splints were removed, the limb moved for a couple of days causing some degree of inflammation and pain, gutta percha splints applied, and a nourishing diet. Tonics and wine ordered; he perfectly recovered.

4th. "Arjoon" Mahratta Tindal, admitted 20th January 1851, having whilst in the act of assisting to lower the mast of a pattamar received a blow from it, just above the mouth on the left side, where there are two small wounds, the blow had separated the superior maxillary bone from its fellow on the opposite side, and all along the palatine plate, so that the teeth and alveolar processes on this side were detached; there had been a good deal of bleeding from both mouth and nose. The parts were put in as accurate position as possible, the wounds dressed, the mouth closely shut and a bandage applied, a good deal of swelling took place, but went down under appropriate treatment; he was fed on fluids and left the hospital quite well February 14th.

Four cases required capital operations during the past year. The first case was "Neelan Malaken" a Chermar, aged 22, admitted February 13th, who being amongst

some bushes near Mallcapooram, 36 miles distant and mistaken for a pig by some natives out shooting, was fired at by them and sustained a compound comminuted fracture of the left thigh, about ¾ of an inch above the condyles, the laceration was very extensive nearly as high as the middle of the thigh and the wound filled with broken fragments of bone, the artery appearing to have escaped injury; the limb was greatly swollen and sloughing had commenced, (the wound had been reeeived five days previous to admission) pulse small 144. Bowels confined for three days and a good deal of pyrexia present. The wound being cleansed as far as was practicable a large poultice was applied, a cathartic enema administered which brought away much scybala and a dose of morphia with emetie tartar and camphor mixture given at bed time. The following day the pulse having fallen to 120 and the patient being free from fever, amputation was performed by the circular method about the middle of the thigh, two arteries requiring ligatures; he bore the operation well, but had for two or three days subsequently a sharp attack of fever requiring aetive treatment; on the 6th day both the ligatures came away and he was discharged well on the 4th April.

This amputation was very well and neatly performed by 2d dresser Nery.

2d. Another case requiring amputation was in the person of "Vellen" Chermar, aged 28, admitted 25th June 1851 with the whole left hand and forearm one mass of scrophulous disease and ulceration, several glands enlarged about the elbow, the fingers enlarged, widely separated and distorted; of two years' duration and said to have originated from the bite of a rat; the bones being diseased and no hope of saving the limb, and the man very anxious for its removal, amputation was at once resorted to, by the circular method; four arteries

required ligature, the last of which did not come away, till the 14th day, and he was discharged well on the 22d July.

I may remark regarding this man that he has twice returned to hospital not on his own account, but each time bringing an applicant for relief.

The 3d case requiring amputation was that of a female named "Amenah" a Mopla aged 45, who came September 5, 1851, from a considerable distance with disease of the right arm very similar to the last case, of five years' standing and very anxious for its removal, it being a great burden to her; four times the natural size, covered with foul ulcers and the bones diseased, the skin generally over the body had a scaly, cracked and leprous appearance. Amputation was performed about the middle of the arm, four ligatures were required, which came away on the 19th, and she was discharged cured and in better health than she had been for years on the 10th October.

The 4th was a case entered ulcus grave in the register in the person of "Hoossain" a Mussalman, aged 45, and admitted 24th October 1851; he was a poor emaciated creature, existing upon charity and for many years had suffered from scrophulous degeneration of the tarsal bones of the right foot which is much distorted and the whole plantar surface covered by a tubercular looking ulceration, the discharge from which was copious and very offensive; the knee also was stiff and could not be fully extended, his right hand is much deformed from an accident in infancy. He was put upon a nourishing diet with tonics and his health having considerably improved, amputation by the flap operation was performed about the middle of the leg, on the 11th November he having first been put under the influence of chloroform, by Assistant Apothecary J. Rozario; three vessels required

ligatures and after the stump was dressed he declared he had felt no pain and in fact burst into tears on seeing that his leg was gone. Secondary hœmorrhage came on very soon after he was removed to bed, the flap had to be opened and a muscular branch on its posterior edge secured, bleeding again returned at the hour of the evening visit, this being found to proceed from the vessels of the medullary matter of the tibia, was suppressed by a piece of lint soaked in tincture of muriate of iron; he ultimately did well and was discharged with a wooden leg on the 30th December.

The deaths during the period under review (21), have not been quite so numerous as last year, many of these occurred in persons in the very last stage of disease and destitution being frequently found lying about the roads and brought in by the police, this of course makes the mortality appear higher than it otherwise would be, but though clearly beyond remedial aid, it is impossible to refuse refuge to dying creatures of the above description; I may enumerate 2 deaths from variola, 2 anasarca, 1 ascites, 2 dysentery, 1 syphilis consecutiva in a poor much emaciated female with extensive sloughing of the genitals and where the vagina and rectum communicated. 1 splenitis in a child with abscess in the spleen, posterior curvature of the spine, and scrophulous disease of the bones, 1 rheumatism chronic, in an old man who was 3 days in hospital and died suddenly from serous apoplexy, 1 fracture in a lad who by the discharge of some fire works received a severe lacerated wound over the sacrum, exposing the bone and fracturing a portion of the posterior superior spinous process of the ilium on the right side, he was five days in hospital when tetanus came on and carried him off in 24 hours; calomel, opium, mercurial inunction, turpentine enemas

were the principal remedies. There was another death from tetanus, but the patient was brought in the last stage and only lived 1½ hours, he had received an injury of the spine by a fall on board a pattimar 12 days previously, tetanus ensued on the 19th day, and when admitted his breathing was hurried and every attempt at opening the mouth or swallowing a little fluid excited fearful spasms; after the inhalation of chloroform he was enabled to get down a dose of calomel with 4 drops of croton oil and the pulse being 112 hard and full he was bled from the arm with temporary relief, his pulse falling to 94 and becoming small and soft. A turpentine enema was administered, but about half an hour afterwards a very violent general convulsion came on; chloroform was again given to inhale but appeared to have no effect and he shortly afterwards expired. No examination of the body was allowed.

CALICUT, 1st *January*, 1852. — E. J. BARKER, *Civil Surgeon Malabar.*

EXTRACT FROM THE REPORT OF THE CIVIL DISPENSARY COIMBATORE FOR THE YEAR 1851.—BY ASSISTANT SURGEON H. W. PORTEOUS.

FROM Mania there were 6 victims to the nefarious practices of a gang of thieves, who made use of the Datura to effect their purpose, and those admitted were all labouring under its effects, from which they recovered. In one, 6 scruple doses of sulph. of zinc, three of ipecacuahna, and one of sulph. cupri. failed to promote vomiting, which is a symptom I have never observed, as caused by the poison, and one difficult to induce. I have failed in doing so in three cases, in two of which, the stomach pump was had recourse to with effect in removing entire and portion of seeds. The police authorities were put on the alert, and succeeded in ap-

prehending the gang, who were brought to trial, on which it came out, that in one tour they had made, 11 parties had had the drug administered, to one of whom it proved fatal, in every case they succeeded in their object of robbing; the method they practiced of exhibiting the datura, was by mixing a portion of the pounded seeds either in the rice, curry or pepper-water, which they invited travellers to partake of. The charge was proved against them and sentenced accordingly. The plant is to be found on every road side of this district, and 8 grains or 48 seeds, are sufficient to produce its full effects, and which may show themselves in from 2 to 3 hours on a strong able bodied man, and last 14 hours, characterized first by a feeling of giddiness, which may come on suddenly, (in one instance the patient was cooking, and so rapid was it, that he let fall a chatty of curry, and scalded his feet severely,) double vision, and as if motes were before the eyes, followed by restlessness, walking to and fro, jabbering, laughing, singing, or vociferating aloud, in some incessant; grasping at objects, as if in reality before them; then sitting down, and as it were picking up particles, and collecting them into a heap; standing against a wall picking at imaginary object off it, or around, and when I have had my watch in my hand counting their pulse, trying to lay hold of it, as if near, evidently showing a derangement in the power of vision. Pupils dilated, and conjunctiva occasionally injected. Pulse full and varied from 96 to 104—no vomiting or purging. The excitement lasts from 6 to 8 hours when the dose has not been excessive, then subsides, and a comutose state varying in intensity supervenes, or it may end in profound sleep, from which when the patient recovers, has little to complain of, and before the day is out, feels quite well. The only treatment required has been emetics, and an active purgative.

Tetanus from which two in-patients died of the traumatic form and one severe idiopatic case, made a perfect recovery.

One, a Brahmin boy, who had sustained a fracture of right radius and ulna 8 days previously, and had been under the treatment of a potter, who had bound up the displaced bones tightly with bamboo sticks, and a mixture of clay, oil, and eggs; when brought, the arm was in a distorted, tense and tighly inflamed state, and the patient's sufferings most excruciating from the severity of the tetanic spasms. Chloroform was administered, and when under its influence, the fracture was set and carefully bandaged, and cold applications applied; as soon as the anaesthetic influence passed off, the spasms recurred, when it was again and again had recourse to, with other treatment, but he expired on the following day.

The second case occurred in a boy, who had received a slight wound over the first joint of his left thumb 8 days previously, and which had nearly cicatrized, when tetanic symptoms began gradually to develope themselves a fresh preparation of cannabis indica was administered freely, no extract being obtainable. Chloroform was also used every 3d hour in the treatment, which gave great hope of success, but he died on the 8th day after admission. A third case, consequent on a most trifling contused wound at the back of the heel in a sepoy's wife, I also attended, which proved fatal, the symptoms set in on the 9th day when the wound was nearly cicatrized.

The case of idiopatic tetanus was above a month under treatment and made a good recovery. Chloroform was frequently given and implored for by the patient when the spasmodic pain was severe, cold effusion seemed to be of essential benefit in the case.

Coimbatore, 1st *January*, 1852. (Signed) H. PORTEOUS, *Zillah Surgeon.*

EXTRACT FROM THE REPORT OF THE CIVIL DISPENSARY, COIMBATORE, FOR THE YEAR 1852.

BY ASSISTANT SURGEON PORTEOUS.

With the exception of cholera, which was prevalent throughout the district during the month of January, and more particularly in the talook of Coimbatore in June, the district has been free from any epidemic form of disease. There were no discernible atmospheric changes, or influences at work, to account for the visitation, the weather being remarkably fine at both periods; in January, the mornings and nights were cool, with a clear pleasant atmosphere during the day, and a strong cool wind blowing, varying from east to north east. In June again when the south west wind had set in strong, and the usual cool pleasant weather, with no great variation in temperature and cloudy, it appeared, but at neither periods were its ravages by any means great, the total casualties in the town including both periods amounted to 158; of these there were 78 males and 80 females, located in the most favorable and unfavorable localities, the disease having made no distinction. Those who applied for aid at the dispensary had been many hours ill, and the most valuable period of treating it lost, which accounts for the large proportion of deaths, which are included in the number above noticed.

Remarks on the Principal Classes of Disease.

Fevers.—These have formed no less than 787 admissions from among the out, and 29 of the in-patients; from the former, no casualty occurred, in the latter, there were 2; the quotidian intermittent was the prevailing type, and with few exceptions, was of a mild, and tractable form. The monthly admissions shewing no very great fluctuations. Those of the remittent character, were nearly all parties from the district, and of those,

there were several grades of severity, in which the head was affected, requiring local depletion. The two fatal cases were both admitted in a hopeless, comatose state; one a horsekeeper from the Neilgherries brought in in the morning, and expired the same afternoon, he had been 11 days ill. The other came under treatment also in a perfectly insensible state, and expired a few hours after; had been 10 days ill, and brought from an adjacent village.

Fevers of the eruptive form.—Of these there have been almost a total immunity, only a solitary case of varicella, and which is a favorable proof, that vaccination has exerted its beneficial influence throughout the town, no case of variola having been admitted.

Diseases of the Lungs.—From this class there are 41 out, and 4 in-patients, with one death in the latter; chronic catarrh forming the largest proportion, and the most readily yielding to the means used. The cases of acute bronchitis occurred in children; that of pneumonia in a robust European, from wet and exposure, while on the hills, his case terminated favorably. One under phthisis admitted in a very advanced stage, with colliquative diarrhœa, expired on the 3d day, a 2d an out-patient, was discharged relieved. In his case I found the counter irritating effects of croton oil, most serviceable, as well as in many of the catarrhal affections.

Diseases of the Liver.—As was the case last year, diseases of this class, are rarely met with, there being only two of icterus; one of the three cases of hepatitis, was in a native bandy driver, the other two in-patients, one a European and the other an East Indian, both came from a distance for treatment, which was effectually administered.

Diseases of the Stomach and Bowels.—This class forms

the next greatest bulk of the admissions, of which there are 363 out, and 9 in-patients, among the former, no casualties, though there were many of severe forms, which yielded to the measures resorted to for their relief; 2 casualties occurred from diarrhœa among the in-patients, one a female whose case was complicated with anasarca, the other, that of a byraghee, who was on his way from Benares to Ramissarum, admitted in a most reduced state, with œdematous extremities.

Epidemic Cholera.—This disease in the early part of the year was prevalent throughout the district, though the cases were not numerous at any one place. It again prevailed in the middle of the year, when it was chiefly confined to the talook of Coimbatore, the total deaths on both cases amounted to 158. The disease was not characterized by any new features. The reports from the various authorities, to whom liberal supplies of cholera pills were distributed in both out breaks, were favorable.

Diseases of the Brain.—From this class, there were 82 out, and one in-patient, cephalalgia of different degrees of severity, forming a very large proportion, and which were all speedily amenable to treatment, only a few requiring depletion. Those from paralysis were not recent cases, and derived but little benefit from treatment; one, who had been two years hemiplegic, was complicated with anasarca, and proved fatal. The case of mania was caused by the seeds of datura, repeated emetics of sulphate of zinc, followed by an aperient, was all that was necessary; two doses (scruple) of zinc failed to cause vomiting, it was produced by the 3d dose.

Epilepsy.—The five patients with this distressing disease were all subjects who had had repeated attacks, and obtained only temporary relief.

Dropsies.—Of these there are seven admissions, four from general anasarca, consequent on long continued attacks of fever in persons whose constitutions had become broken down; three proved fatal, one a female byraghee who was in a most hopeless state, a second a cooly in which there was extensive effusion in the right side of the chest, he was admitted in a most reduced state having been long in ill-health.

The case of ascites in the out-patient and which remained last year was one of ovarian dropsy in which tapping was resorted to on five occasions with relief to urgent symptoms. The patient gradually sunk having become emaciated to the greatest possible degree. The other an in-patient was cured by active purgatives, no operation was necessary.

Rheumatic Affections.—These form a large bulk 218 admissions among the out, and 12 in the in-patients, none could be said to be of a very severe nature; though some of the attacks among the in-patients were of an acute form, they were on the whole very tractable, those being the most tedious, which were consequent on old venereal affections, and which were generally in a reduced state and had been sufferers for some time; no casualty occurred.

Venereal Affections.—I think the town may be said to be particularly free from these ailments. The admissions amounting to only 115 of out, and 21 in-patients, of these there were but 39 with primary sores, and which yielded in every instance most satisfactorily; in a few an occasional mercurial was given, in none, was the system affected. The secondary cases presented most frequently in the shape of eruptions, a few with ulcerated throat and tonsils, there being a peculiar exemption from the more aggravated characters of the disease.

The case of procidentia uteri was of a very aggravated nature, the vagina being completely everted, no great difficulty was experienced in replacing the organ, but it was found difficult to retain it in site.

Abscess and Ulcers.—Next to fevers this class of disease has been the cause of the greatest number of admissions, there being 442 out, and 26 in-patients, and among both eases, from the most severe to a trifling extent, have been treated, with two exeeptions successfully, and these were to an extent, I had never previously witnessed; one a Brahmin tasildar a very plethoric and large made man, brought in from a distant talook with the entire right side of his face and head in a gangrenous state, with most extensive diffused cellular inflammation of the neck. Free incisions were made to give vent to the immense quantities of pent up matter, as much of the sloughs removed as possible. Nitric acid, hot dressing and poultices applied, with good nourishing diet, but he sunk three days after admittance. The second fatal case was one of ulcus in an elephant driver sent in from the Annamally forest, suffering from fever, much emaciated and having an extensive ulcer below the right knee, which varied exceedingly, healing and then breaking out again. He had repeated attacks of diarrhœa, and the ulcer became affected with gangrene which spread rapidly, destroying the outer portion of the thigh, under which he sunk.

Wounds and injuries were of a most varied charaeter, and extent, 249 out, and 29 in-patients eame under treatment. Three with luxations, of these two of the humerus, were readily reduced, one under chloroform, the third was of the hip, irreducible and had been six months dislocated. Incised wounds 89 out, and 7 in-patients of these 10 were eriminal cases and were of a

severe nature inflicted by bill hooks, over every portion of the body; all were treated successfully but one case, which will be noticed elsewhere. Lacerated wounds eight out, and nine in-patients, all these formed cases of criminal process, and were all inflicted by tearing off the ear ornaments forcibly. In only one instance was much deformity caused, the united portions having sloughed away. The divided extremities of the lobe were generally cut even with scissors, and brought together and retained by a couple of pins, and a surface of collodion given around, with speedy and satisfactory results.

The treatment when healing by the first intention was likely to succeed, it was invariably tried, but those cases were few, almost all, having their wounds, either foul, or filled up with charcoal and oil, or jaggery and chunam, requiring some days ere they would clean, when either strap, or lotion was used.

Ambustio.—The 13 patients treated for burns were not to a very severe degree, ten were severe scalds from boiling fluids, and three from gun powder; cotton dressing formed the treatment.

Fractures.—Four of these were treated as in, and three as out-patients. One a compound fracture of the thigh in a female where there was most extensive laceration of the parts, a loaded cart passing obliquely over the thigh; she made a good recovery.

A compound fracture of the humerus which was received in a most distressing state, the whole arm immensely swollen, and covered with blebs, and extensive collection of matter around elbow joint; the patient has made a good recovery. A compound comminuted fracture of tibia and fibula, this was the subject of a criminal case and he promised to do well, though he was most severely injured, the right knee joint from

hard blows, was immensely swollen, and pain excessive, his sufferings altogether were great, being 25 days before he was brought in from a distance of 60 miles; a pint of matter was removed from the right knee by incision, diarrhœa ensued, and was followed by gangrene of the fractured extremity; both bones had united; the 4th in-patient was a fracture of the thigh in a boy set under chloroform and did well.

The cases in the out-patients, were one of the left clavicle, a second, left radius and ulna, and a third, the right radius, these all did well.

Diseases of the Eye.—The admissions in this class were 101 out, and 4 in-patients. The former consisted solely of cases of conjunctival and schlerotic inflammations with a few of ulcerated and nebulous corneæ, not one of cataract. The 10 and 20 grains solution of the nitrate of silver and an aperient constituted almost the sole treatment for those affected with purulent ophthalmia. They were all of a tractable form, one of the cases treated in the hospital was rather interesting, the cornea had been divided perpendicularly by a stone, most extensive inflammation existed; but the boy was of a good constitution and made a better recovery than I expected, the iris adheres to the cornea, and there is a dense opaque mass obliterating the pupil with extensive cicatrix on cornea; a second also a severe injury by a pointed piece of wood penetrating the cornea, did well.

Under all other diseases, those of the ear form the most numerous, amounting to 117 out-patients, otorrhœa occurring principally in the young, otitis and otalgia in those of more advanced ages. In the former injections of sulphate of zinc seldom failed in checking it, in the latter, occasionally local bleeding, blisters with fomenta-

tions brought about a favorable relief, none were protracted.

Tumores.—13 are recorded as out, and 3 as in-patients, three were of a malignant character, and ten non-malignant extirpated under chloroform, and without exception all healed by the first intention. Of the malignant, one was of an enormous nodulated form, for the removal of which, it was necessary to amputate the leg, at its upper third, nothing could exceed the favourable progress of the patient. Almost complete union by the first intention followed, and a well formed stump; on the 9th day however the patient was carried off most unfortunately by tetanus; the patient was a ryot in comfortable circumstances, and had come from a distance of 60 miles, solely for the purpose of having the limb removed, which was done under chloroform previous to bringing him into the operating ward, and which is decidedly the most advisable course, where there are a large assemblage. The second case was one of scirrhus of the left testis, which was extirpated under chloroform, and made a remarkably quick recovery. The third, of the hand in a Brahmin, in good circumstances, he attended as an out-patient; on all occasions the attendance at operations were numerous, and chloroform was invariably used with no ill effects.

Under morsus, admission from the bite of a snake admitted with the leg immensely swollen and painful, and around site of bite, appearance as if sloughing would ensue; considerable pyrexia; sloughing was prevented and the case terminated favorably, the kind of snake was not ascertained.

Four bites from dogs proved exceedingly tedious, two from monkeys were also troublesome and suppurated; one in a little boy, whose feet were much gnawed by a bandicoot was slow in healing.

Remarks on those cases which have been worthy of Notice.

Though there have been many very interesting cases throughout the year, I consider the following one of such a very extraordinary character in a surgical point of view and valuable in a medico-legal point of view, as to merit being recorded in detail from the hospital journal; a perusal of the case will excite wonder and astonishment, that life should have been prolonged under such a series of mortal wounds, and that the mental faculties were perfect to the last, while the cranium had sustained such extensive removals of bone from it, viz., 3 portions exposing about 4 square inches of the brain, and the still existing extensive effusions of blood, and depressed portions of bone under the 3 wounds, dividing both plates, 2, and 3 inches in extent, with fractures extending longitudinally through the orbital plate, to the occipital, and transversally through the parietal and frontal bones.

Vulnus Incisum.

Coluntha Umah, aged 40, caste Hindoo, occupation dancing, temperament sanguine, 3d June 4 o'clock P. M. brought to the dispensary most barbarously and dangerously wounded.

1st. Having a gaping incised wound, extending from the front of her right ear to the angle of the lip, dividing the zygomatic process of the temporal bone and all the intermediate parts.

2d. On the left side of her head, a wound 4 inches long, completely separating a portion of the left parietal bone, to the extent of 3 inches in length, and 1½ in breath, and which is retained, by little more than adhesion to the scalp. The bone projects 1½ inch from the side of the head, exposing the brain, the pulsation of

which is seen over the above extent; much clotted-blood fills a part of the gap, any attempt to approximate the fragment, cannot be borne, nor would it be advisable.

3d. About one inch above this wound, a second, 2 inches long, cutting through the parietal bone to that extent.

4th. On the crown of the head, towards its right side, a longitudinal scalp wound 6 inches, dividing the right parietal bone to the length of 3 inches, copious hœmorrhage.

5th. Across the front part of this wound, is another 3 inches long, cutting through the frontal bone to the same extent.

6th. Across the posterior part of the longitudinal wound, another 2¾ inches long, separating the back part of the parietal bone, nearly to the same extent, oozing of blood from it.

7th. Along the right temple, and right side of the head, a wound 4 inches long, dividing the frontal bone from the superciliary ridge, backwards to the parietal.

8th. Several smaller scalp wounds.

9th. Left half of upper lip divided along with the lateral incisor.

10th. On back of right shoulder, an incised wound, 3 inches long, penetrating to the spine of the scapula.

11th. A superficial wound near the bend of the arm.

12th. Seven incised wounds on her left arm.

13th. 1st, 2nd and 3rd fingers almost separated, thumb and little finger also nearly so.

In this mutilated state the patient is perfectly sensible, pupils act regularly, pulse 104, small and regular, skin natural, she is in her *ninth month of pregnancy.* The

hair being removed as carefully as possible, the wounds were cleansed, and such as admitted of being brought together, were approximated, and the head encircled by a bandage, avoiding compressing the separated portion of bone. I then visited the yard where the foul perpetrator, had committed these acts, and there beheld the poor patient's daughter a corpse in a most dreadfully mangled state. It was impossible to form an opinion as to the amount of blood lost, that of mother and two daughters, being intermingled, the wound on the surviving daughter is a very severe one, 3 inches long at the lower and back part of neck, all had been inflicted with a powerful sharp edged weapon.

4th A. M. Groaned most of the night, is now easier, and complains chiefly of pain in the lower extremities—skin natural, pulse 98 and weak, is perfectly sensible, and calls for conjee from time to time. The lateral wound gapes more, the pulsation of brain though most distinct, less strong, the only dressing over this wound is a piece of lint, none of the other wounds examined

Vesp. Since 11 A. M. has been very restless and groaned, says she has no pain in her head, only in the limbs, bowels not moved, micturated several times. An emollient enema, the wounds not examined.

5th. Slept from 8 till 10 P. M. and again from 1 till 3 A. M. and since then she has lain quiet. Wound on face uniting; the lateral wound, and projecting bone causing evident distress; if touched, she shrieks aloud, and it is hardly possible to prevent her moving her head, which if she does is fraught with such agony, I have decided on detaching the portion of bone.

The removal effected most marked relief, the large, flap was brought up, and retained by straps. Wounds cleansed, and redressed.

To have sago and milk as she may call for it.

Vesp. 5 P. M. has moaned much during the day and lain equally on both sides of the head, became more restless the last hour, pulse 96 and regular, skin warm, taken sufficient support, wounds not examined.

8 P. M. reported that labour pains had commenced, attended immediately, on arrival found a still-born male child, delivery of which was easy and rapid, she is now easy and composed.

Rx. Morph. gr. ½ to be taken if restlessness returns.

6th. Passed a quiet night, and slept, skin warm and moist, pulse 100 regular, but weak. Tongue moist, no moaning, and lies on the side the bone was removed from, which has been a great relief, wounds discharging, which have been cleansed and redressed.

Diet as yesterday.

Vesp. Has been very easy, moaning occasionally. Has taken sago and milk and some pepper water, skin warm, pulse 94 weak, no head symptoms.

7th. A sleepless night, but lay easy and did not moan, I told her the murderer was caught, she at once said his head must be cut off. The wounds have all a thick healthy discharge. The large flap which is composed of scalp, and temporal muscle has a thick discharge on it; she lies more on it than the other side, tongue is cleaner, and more favorable looking, as also her whole appearance. The large wound dividing the face united, and the one at back of shoulder; no discharge from hand; total absence of all head symptoms.

Wounds cleansed and dressed.

Vesp. Has lain without moaning, chiefly on the left side, tongue moist, pulse 104 weak, voice more feeble,

and answers shorty to questions, bowels freely moved; dressed the wounds.

8th. Moaned much since 12 P. M.; thirst, and increasing drowsiness, with slight stertor; when roused, replies to questions only by one or two words, teeth have become sordid, and whole appearance most unfavorable, pulse weaker, skin cool, tongue dry, and raspy, wounds assumed an unhealthy look.

Warm poultices to entire head and to be frequently changed.

Vesp. Much less drowsy, and has sat up, in preference to lying down; only sustenance taken was some pepper water; stertor subsided, tongue moist, pulse 104 and weak.

Continue poultices.

9th. Slept, prefers sitting up, and without assistance, moved from her cot to some distance from it, tongue dry and raspy, pulse small and weak 100, wounds white and flabby, pulsation of brain very distinct, she is at times uncollected, and calls out loudly, as if from pain, and moans afterwards for some time; does not reply when spoken to, but motions with her head.

Continue poultices.

Vesp. No change.

10th. A very restless, and noisy night, and unless retained would have wandered from the ward, she recognizes parties, but does not reply when spoken to, skin warm, pulse 100, pupils act; wounds unhealthy.

Continue poultices.

Vesp. Has had two convulsive fits, which lasted 5 and 10 minutes, and has moaned, and cried aloud, frequently, has remained in a sitting posture, does not

reply when spoken to, though by her eye, she appears to understand.

Continue poultices.

11th. Two fits during the night, still sits up, occasionally replies when spoken to, and called her daughter to come and sit by her, tongue moist, pulse somewhat strong, pupils act regularly; wounds assumed a little more promising aspect, brain protrudes from the lateral opening, dura mater covered with healthy pus.

Continue warm poultices.

Vesp. At mid-day slight convulsive fit with insensibility, it lasted 5 minutes after which, became sensible, and asked for water, she then slept and moaned very little; remained in the sitting posture, took more food than she had done for several days; appears now easy and perfectly sensible, pulse very much stronger, and fuller 94, and regular, skin warm, tongue moist, and appearance favorable.

Rx. Calomel gr. v.
Pulvis. Antim. gr. v.

12th. Complains she had much pain in wounds of head during the night, they look much more favorable; from the wounds at the back part of the head removed 3 portions of external plate of bone, and 2 from wound on the forehead, on close examination of wound on left side, from whence the large portion of bone was removed a fracture is observed extending upwards towards the coronal suture.

Posteriorly a portion of bone with a base of three inches feels loose, and only adherent to scalp, and accounts for her not lying on that side of the head, as she cannot bear pressure on it, she converses more freely than she has yet done, and now comparatively

easy, and looks about her; skin comfortable, tongue moist, and loaded, pulse 90 strong, and regular, bowels open.

Poultice to head; as she wishes a little curry to be allowed it.

Vesp. Has passed a good day, and been conversing with her friends, says she is quite free from pain; free discharge from wounds on head which is fœtid.

Rx. Calomel gr. iii.
Pulv. Antim. gr. v. H. S.

13th. Slept several hours and is cheerful and talks, discharge fœtid and portions of bone loose posteriorly.

The scalp was firmly adherent, black grumous blood, and fœtid discharge under the bone; at the place where the portion of bone was first removed, there is increasing protrusion of the brain, free discharge from the surface. After the removal of the bones she spoke to the Judge quite fluently in the presence of two other gentlemen, and spoke with a good loud voice, and gestured with her hands, explaining how the murderer had acted. It being impossible to conceive a person shewing such an apparent utter want of all suffering. Flaps brought together, retained by adhesive straps, and poultice over all.

Vesp. Free fœtid discharge from the wounds, pulse is quicker than usual, she took some curry and rice for her meals. While dressing the wounds, laughed, and talked incoherently, has lain down more than usual.

No medicines.

14th. This woman's husband having given her secretly some arrack, the dresser found her at 12 P. M. suffering under its effects, (she confesses to have taken it) rising up, and lying down and talking what he could not understand; at 2 was asleep, her tongue dry, and

glazed, and appearance unfavorable, she is perfectly sensible but is unable to sit up without being held, pulse quick and small.

Poultices to wounds.

Vesp. Symptoms still more unfavorable, breathing stertorous, and with difficulty roused and does not reply to questions. Teeth covered with sordes, and tongue dry, and raspy, tumor pulsates strongly and of a dark livid colour, pulse small, irregular and intermitting, pupils fixed, at the morning visit she allowed having drank the arrack. Her daughter who lies wounded near her, states that she asked for it, and said she would eat no supper, unless the arrack was given her.

Fresh Poultices to wounds.

15th. Expired at 4 o'clock this morning being the 12th day since the receipt of the injuries; with some difficulty a post mortem was obtained and the cranium alone examined, which presented I am of opinion a greater amount of injury than almost any case on record where *life* had been *preserved* so long afterwards, and from the specimen being probably in all likelihood to stand unprecedented, at every risk, I resolved to retain it and succeeded.

1st. In site of wound of the face the zygomatic process of right temporal bone is found divided in its middle, and a portion to the extent of $\frac{1}{8}$ of an inch removed, without having shaken its connection with the molar.

2d. In site of wound No. 2, there is the space from which the portion of parietal bone was removed, exhibiting a clean cut edge along its upper margin, and irregularly fractured around. The protrusion of brain with considerable ecchymosis around, about one inch above, and anteriorly a clean cut, one inch long, through

the parietal, involving a portion of the frontal with its suture, the piece of bone about an inch square, is only connected at its inferior angle, across which there is also a fracture, its site shewn in the outlines, an extensive effusion of blood with numerous small spiculae of bone under this wound. The dura mater of a livid colour no suppuration.

In site of the longitudinal wound there exists the extensive opening formed by the removal of the portions of the parietal bone, and from this opening posteriorly a fracture extending downwards, and then forwards through the entire portion of the squamous plate of the temporal bone, its connection with the parietal separated by the severity of the blows.

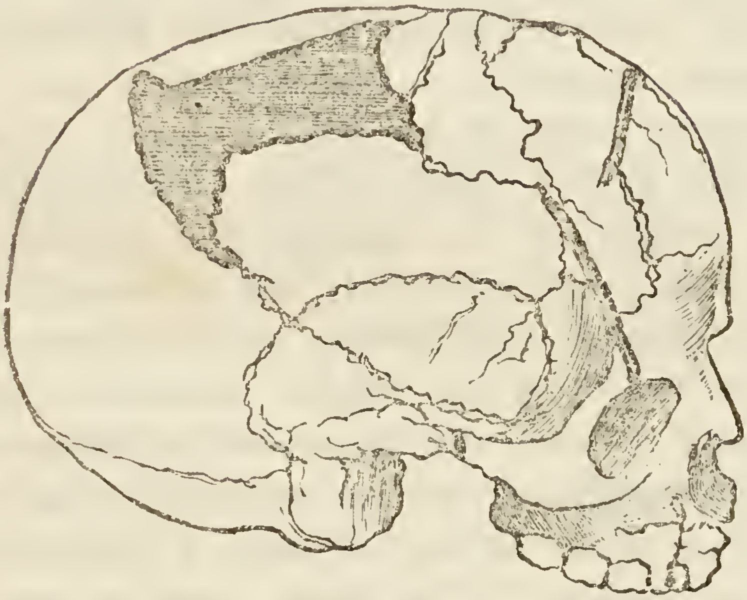
A second fracture upwards, to the superior angle of parietal, and a third forward, which joins the wound on the temple and side of the head; the frontal bone being there clean cut through, from the centre of the superciliary ridge, backwards to the coronal suture, to which the fracture above named extends, from the division on the superciliary ridge, a fracture extends backwards throughout the orbital plate; below this wound, there existed a very extensive effusion of blood, and many small portions of bone.

In site of wound on the anterior part of the longitudinal one, is a clean cut, three inches long, across the frontal bone, penetrating in the centre, and extensively fractured interiorly, in a half circular direction of three inches diameter; extensive effusion of blood, and many spiculae of bone. The wound of the upper lip united, and was connected with an irregular fracture of the superior maxillary bone.

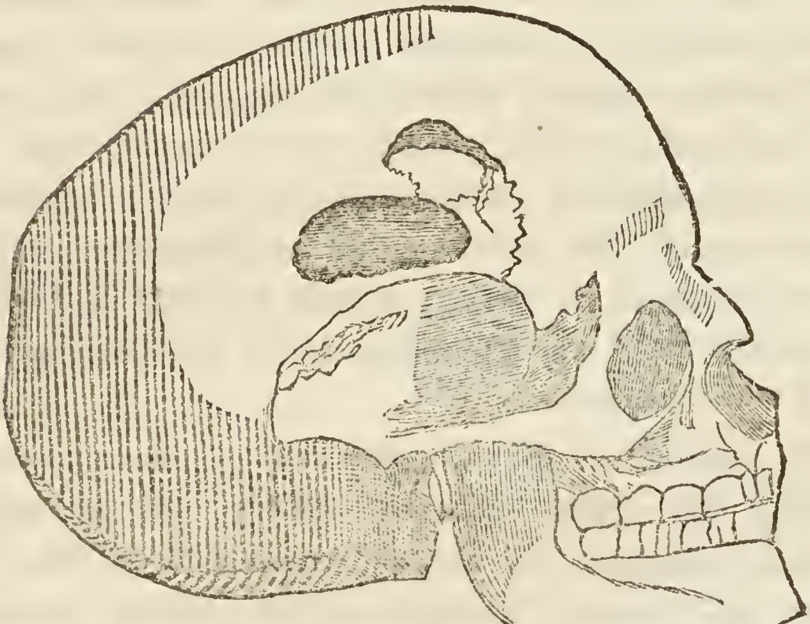
No unusual appearance observed in the substance of the brain, which was firm, and presented no increased vascularity nor did I detect that the dura mater had been wounded; the death of this patient was most unfortunately accelerated, by the intoxicating amount of arrack she had imbibed, and much to be regretted was the occurrence, although recovery could not have been expected; the case was one of such interest, in her having survived so long, and rallied so well after the appearance of unfavorable symptoms, the extraordinary freedom from all apparent suffering, clearness of her intellect, and loquacity after the removal of the last 2 portions of bone, was a matter of amazement; I can only account for the retarded absence of the symptoms of compression from the free exit the blood had through the many openings, although again there were sufficient causes besides from small portions of loose bone, and depression of the internal plate of frontal to have produced compression.

The institution has the entire confidence of the inhabitants, and looked upon by them, as a boon of the greatest value. It has been resorted to by the highest, and lowest both as in, and out-patients; of the former 85 availed themselves of the privilege of residing in it for the benefit of treatment, and dieting themselves, leaving only 75 who were unable to do so. The many operations were all numerously attended, and an interest taken in the poor sufferers, by the parties, who had ample means of seeing the immense benefits to the public afforded by the dispensary which I have had much pleasure and satisfaction in conducting, with the assistance of 2d dresser Veerasawmy, whose conduct throughout, has been unexceptionable and praiseworthy.

Outline of Injuries on the Right Parietal Frontal and Temperal Bone.



Outline of the Injuries on the left Parietal Bone.



COIMBATORE, }
1st *January*, 1853. }

H. W. PORTEOUS,
Civil Surgeon.

REPORT UPON THE HYDROCOTYLE ASIATICA.

BY ASSISTANT SURGEON A. HUNTER, M. D.

Agreeably to instructions contained in letter No. 58, dated 11th January 1854, from the Medical Board, the following report upon the characters and uses of the *Hydrocotyle Asiatica* has been prepared. This plant was brought to the notice of the Indian drug committee by surgeon E. G. Balfour who received intimation of its having been extensively and successfully employed in the treatment of leprosy at Pondicherry. Seven numbers of the Moniteur Officiel containing notices of the plant and its uses were forwarded at different times to the drug committee, and the secretary having previously found the plant in the vicinity of Madras had no difficulty in procuring it in large quantities for experiment and report. 200 ℔s. of the fresh plant were obtained from the commissariat on indent, after a few samples had been identified by the professor of botany; drawings and sections showing the characters of the plant are herewith forwarded to the Medical Board.

Le Moniteur Officiel of the 5th August 1853, contains a few interesting remarks on this plant by Mr. Jules Lépine, this gentleman at first thought that the Hydrocotyle Asiatica found by Dr. *Boileau* at the Mauritius, and from which he prepared a remedy which he named bevilacqua was identical with the Chinchunchully of America largely exported to China.

M. Poupeau and *M. Houbert* tried the hydrocotyle medicinally in several diseases besides leprosy and with considerable success. It was ascertained from Dr. Boileau that the bevil aqua belongs to the family umbelliferæ and the chinchunchully to the violariæ, Dr. Balfour recommends it strongly as a safe and valuable remedy.

The following was the mode of treatment first adopted by him; 15 days to 3 weeks, infusion, warm bath,

baths of fumigation, two ounces of the whole fresh plant dried in the shade to a bottle of infusion to be taken during the day, 96 grains when dry, this was found to be too much.

Three pounds of the green plant for a warm bath.

Five do. do. for a fumigation bath.

The simple syrup augmenting from one table spoonful to three daily, persevering for three weeks to a month with three spoonsful daily.

Le Moniteur Officiel of the 26th August 1853, contains further remarks on the same subject. Mr. Jules Lépine commenced the analysis of this plant in the hope of being able to discover its active principle. He was induced to attempt this from the favorable reports made upon it, first by Dr. Boileau of the Mauritius, who suffered from leprosy and had tried it upon himself, with marked benefit, and afterwards by Messrs. Poupeau, Houbert, and M. Collas, who all reported upon its efficacy in the treatment of cutaneous and leprous affections. Dr. Boileau first commenced by giving the powder in doses of 4 grains gradually increased to 20 grains, and 1 table spoonful of syrup increased to four daily; he gave the medicine in wine or tea enjoining the use of good diet, warm clothing, avoiding farinaceous diet, and recommending moderate exercise, a purgative being administered every 8 or 10 days along with baths of sulphur or of sea water. He afterwards modified the treatment, giving only the syrup to infants and not administering the powder till after the age of 10 and using the ointment to sores. He next used the infusion, two ounces of dried plant to a quart of water to be taken daily, and whilst the symptoms improved,, he only gave the syrup and infusion. When the disease remained stationary, the powder was added to the syrup or infusion, the powder being used alone with caution,

The remedy was tried upon 57 lepers with marked benefit. The first effects were found to be a tingling sensation in the skin followed by rapid improvement of the symptoms when tried in recent cases. In those cases in which the disease had been modified by mercury or arsenic, both the external and internal amelioration were well marked. Gangrenous and other sores cicatrised, spots and discolorations of the skin were obliterated, pustular eruptions and scales disappeared, and the skin regained its softness and pliancy. The next change in the treatment recommended by Dr. Boileau was the diminution of the quantity of the fresh hydrocotyle from two ounces to one ounce in a quart of water for making the infusion, and the administering of emetics and purgatives frequently during the course of treatment; increasing the quantity of the syrup from one to eight table spoonsful daily and combining the syrup and the powder occasionally with preparations of iodine.

Before the discovery of Mr. Boileau, the hydrocotyle occupied a place in the materia medica of India. It had been used at Pondicherry and in other parts of India in the form of syrup as an alterative for infants. Horsfield attributes diuretic properties to the plant,* Ainslie says that an infusion of the leaves with fenugreek is employed in certain fevers and diseases of the intestines. M-de-Ferussac pretends that it is alimentary and is used occasionally in salads.

Le Moniteur Officiel 9th September 1853, contains further notices of this plant.

The name of the genus hydrocotyle is derived from two Greek words *ὑδῶρ* water and *κοτυλη* a cup, indicating the shape of the leaves and the habits of the plant. The hydrocotyle asiatica is the pes equinus of Ramphius,

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* He recommends its use in Gravel and Gonorrhœa.

it is called in Tamil, Vallarai, in Hindoostanee, Thulkura in Canarese (after Rheede) Codagen, in Teloogoo, Elouk-atchevikoura or rats ear plant.

It belongs to the family of the umbelliferæ.

Roxburgh gives two Indian species, h: asiatica and h: rotundifolia. Wight describes and figures five species h: asiatica, tenella, polycephala, zeylanica and rotundifolia.

Botanical characters.—The hydrocotyle asiatica is a small herbaceous plant, creeping with short fusiform or fibrous roots from which proceed petiolate, orbicular, reniform, crenated leaves about an inch in diameter, attached by the margin, glabrous, of a clear green, and 7 nerved. Cotyledonary leaves entire rounded. The petioles are from two to six inches in length fistulous, channelled, glabrous, the stalks are filiform not fistulous, trailing, producing at short distances new roots, and a new plant. The peduncles spring from the axles of the leaves, they are usually ternate, fassicled, sprinkled with soft hairs, rarely solitary, from half an inch to an inch in length, coiled up during inflorescence, and recurved on the maturity of the fruit. Umbels capitate, shortly peduncled, few (3 to 4) flowered accompanied with two persistent scales, calyx obliterated, corolla of 5 reddish petals, five stamens shorter than the petals. Pistil filiform, fruit orbicular reticulated with four ribs on each of the flat sides.

This plant is common all over India, it thrives in moist ground on the borders of water courses, tanks and in betel gardens, it flowers all the year round but is most abundant during the rains. The fresh plant has little or no smell but when rubbed or handled it exhales a peculiar aromatic odor, and has a bitter pungent rather disagreeable taste. The dried plant is hygrometric and the leaves are apt to become soft and flaccid on free

exposure to the air; when heated or dried it loses from 70 to 90 per cent. of water; 1000 parts of the fresh plant consists of 910 of leaves and stalks with 90 of flowers and seeds, 1000 parts of the dried plant yield about 10 of dry seed; the fresh plant is very succulent and yields about 76 per cent. of juice by expression, when this is purified by heat and filtration, it presents the following characters, color yellowish brown, reddens litmus paper, is not affected by acids, becomes yellow with alkalies, and throws down precipitates, gives no indication of iodine. Acetate of lead throws down a copious white precipitate, chloride of palladium turns the liquor brown, the chlorides of gold and platinum, tartaric acid and nitrates of silver and mercury throw down white precipitates. The sulphate of copper and the hydrosulphate of ammonia throw down greenish grey precipitates, oxalic acid produces a copious white precipitate. The chloride of barium, bicarbonate of potass and the subsulphate of soda produce white precipitates. From this analysis we may conclude that the juice contains besides organic matters, potass, lime and magnesia combined with sulphuric acid and hydrochloric acids. On comparing with the above results the reaction of the concentrated decoction of hydrocotyle when subjected to the same tests similar indications were obtained with the exception of the following instances, chloride of gold, platinum and palladium, hydrosulphate of ammonia and bicarbonate of potass produced no reaction and that from oxalic acid and subphosphate of soda were very slight. The decoction therefore contained fewer of the mineral salts than the juice.

According to Dr. Boileau the most active preparation of the hydrocotyle is the dry powder, then the syrup and lastly the decoction. Mr. Jules Lépine supposed that the beneficial effects of this remedy depended upon the

presence of iodine and that the plant probably contained active principles soluble in alcohol, water or other liquids; with the view of determining these questions, he subjected the fresh plant, the expressed juice, the decoction, the extract, and the incinerated ashes to the most careful analysis; we need not enter into all the details of the experiments which appear to have been conducted with great minuteness and precision, but we shall content ourselves with the enumeration of such as gave definite results. The incineration of 100 grammes of the plant left an average out of 4 experiments of 15·625 of ash, these ashes contained of salts soluble in water 5,780 parts, salts insoluble in water 6,830. The ashes of the leaves, stalks and seed were tested separately and afterwards the juice and residue, and the decoction and residue; from these experiments it was ascertained that the constituents of these ashes were, chlorides of sodium, magnesium, and potassium, carbonate of potass, sulphate of potass, sulphate of soda, sulphate of lime, phosphate of lime, phosphate of iron, carbonate of lime, carbonate of magnesia, silica, sand and charcoal unconsumed; considerable difference was found in the proportions of the above ingredients, according to the parts of the plants incinerated, the leaves gave the following proportions.

100 grammes of leaves left 14·807 of ashes, having the following constituents:—

Salts soluble in water	6·600
Salts insoluble in water	5·600

These consisted of

Chloride of Magnesium	0·022
Chloride of Sodium	2·780
Chloride of Potassium	2·020
Carbonate of Potass, Sulphate of Potass and Sulphate of Soda	1·200
Sulphate of Lime	0·085
Carbonate of Lime	2·196
Carbonate of Magnesia	0·974

Phosphate of Lime and Iron	2·130
Silica	0·560
Sand and Charcoal	2·540
	14·807

On treating 100 parts of the powder of hydrocotyle with alcohol at a moderate temperature, the latter acquired a dark green color and furnished on evaporation over a water bath 28 of dark green extract, with a pungent odour, this extract was found to be deliquescent; when dissolved in distilled water and filtered, there remained 260 parts of a green resinous matter soluble in ether. The ethereal solution was dark green, the extract was insoluble in water, but almost entirely soluble in 100 parts of alcohol to which it imparted a greenish yellow color, and gave an acid reaction, it left a yellow residue on evaporation, this was soluble in liquor potassæ, but was not acted upon by acetic or hydrochloric acids, nitric acid changed its color to brown, sulphuric acid blackened it. It was soluble in ammonia without losing its color. This substance when heated became liquid, then blackened, emitting white acid vapors, and leaving a carbonaceous residue. The solution of the extract from which the dark green resinous matter was separated was again evaporated to the consistance of an extract, and this when boiled in alcohol left a green insoluble matter possessing all the characters of gum. One part of the solution of the extract gave a precipitate with acetate of lead after 24 hours, this precipitate did not crystalize when treated with sulphureted hydrogen, and subsequently evaporated, and concentrated. From the results of these and numerous other experiments with the entire plant, Mr. Lépine came to the conclusion that 100 parts of the powder of the hydrocotyle asiatica contains the following substances:—

Thick yellow resinous matter soluble in Alcohol (18 deg.)	0·40
Thick brown resinous matter soluble in Alcohol of 30 deg.	0·85
Dark green resin soluble in Alcohol of 36 deg.	2·60
Brownish red extractive (acid)	2·300
Sweet extract	3·20
Gum	2·70
Fecula	4·00
Woody fibre, salts and loss	63·25

In the course of the experiments part of the thick fatty matters may be lost by volatilisation or by remaining incorporated with the extract. In subsequent experiments it was found that chloroform dissolves all the resinous and oily matters of the dried plant. Essence of turpentine when heated acquires an amber yellow color from the powder. Lard and fixed oils also acquire the same color when heated in contact with it, but they do not appear to dissolve the green and brown resins; by digesting the powder in alcohol of 36 degrees, filtering and evaporating the liquor. Mr. Lépine obtained a thick pale yellow oil or extract which appears to be the active principle of the hydrocotyle, to this substance he proposes to give the name of *vellarine* from the Tamil name. This oil has a sharp pungent, bitter, and disagreeable taste, the smell is strong, and the same as that of the plant. This oil is soluble in alcohol (feebly) in ether and in fatty substances; with water it forms an emulsion which is opalescent when filtered. Alkalies do not produce any alteration, but acids throw down a flocculent white precipitate from this emulsion. This oil is neutral to test papers. When exposed to dry air it thickens, and becomes darker in color. In moist atmosphere it liquifies. It is altered by the action of heat and by atmospheric agents, which may account for the small proportions obtained in analyzing the plant.

Lime water changes it into a sulphur yellow grumous matter. It is dissolved by ammonia and precipitated from

this solution by acids, caustic potass changes its color to deep brown but does not dissolve it or form any combination. It is partly soluble in hydrochloric acid, water precipitating it in yellow flocculi, sulphuric acid blackens and dissolves it, water precipitating it in yellow flocculi. When treated with nitric acid a brown oily substance is separated which is insoluble in water. When exposed to heat in a glass tube it boils and is partly volatilised disengaging white acid, acrid vapors, which condense on the sides of the tube in brown oily drops, which have a strong acid reaction and a very disagreeable smell, a carbonaceous residue remains in the tube.

The brown and thick dark green resins which are but sparingly soluble in alcohol do not appear to possess any particular properties excepting that the latter forms a dark colored soap with *liquid potass.*

Those who are interested in the subject of minute quantitative vegetable analyses would do well to peruse the details of the 39 experiments tried upon the hydrocotyle by Mr. Jules Lépine and published in the Moniteur Officiel of Pondicherry 6th August 1853, 26th August, 9th September, 14th October, 11th November, 9th December and 30th December. Mr. Lépine is a careful, minute and accurate observer who has contributed a most important discovery gratuitously to the public, and has given evidence of no ordinary assiduity in the prosecution of an enquiry, which has been carried out to its furthest extent and already bids fair to prove a valuable and important addition to the materia medica of India.

We come now to the most important part of the subject, viz., the therapeutic uses of the hydrocotyle in leprous, venereal and other affections. There are one or two properties possessed by this remedy which prove it to be a valuable addition to the pharmacopeia, and these

are its tendency to act upon the skin and mucous membranes, its tonic and stimulant effects upon the stomach, and its freedom from violent action or local determination to any of the viscera.

The first effect produced by this medicine is a sense of heat or tingling in the skin, especially in the hands and feet. This is followed in the course of a few days by a general glow over the skin of the trunk, which amounts in some cases to a sense of intolerable itching and occasionally a slight papular redness of the skin supervenes, the general capillary circulation being accelerated, the pulse also becoming stronger and fuller; after the medicine has been given for about a week, the appetite becomes sensibly increased and in a few patients it has been voracious. The visceral functions do not appear to be interfered with, even when the medicine is given in large doses; after a time the skin begins to feel softer and smoother, the cuticle gradually desquamates in small scales, or in bad cases in large scurf, the perspiration is restored and the secretions and excretions are increased in quantity. The digestion is improved and the appetite becomes keen and in a few cases ravenous. Mr. Lépine and Dr. Boileau do not allude to the increase of the appetite and the secretions, but they dwell upon the return of soft pliancy in the skin and the healing up of old obstinate and dangerous sores; ample opportunities have presented themselves for testing the value of the hydrocotyle in leprosy as well as other diseases, and although the results have not been quite so satisfactory in all forms of leprosy as was anticipated, still the benefits have been sufficiently well marked in the majority of cases treated with this remedy to entitle it to a place in the pharmacopeia as an efficacious Tonic. We are not prepared to say that it has only a tonic action on the system, as in some cases it has acted as

a diuretic, and in others as a diaphoretic, but its stomachic and tonic properties appear to be the best marked, and we conceive that it is to them that its beneficial effects are chiefly due.

We shall now detail the particulars of its employment first in the leper hospital at Madras, and afterwards in the native infirmary and compare the results with those detailed by Mr. Lépine and Dr. Boileau.

The hydrocotyle asiatica has been administered to 79 lepers in Madras, in the form of powder, (given in cold water) infusion in hot water, decoction and in combination with other remedies as guaiac, iodide of potassium preparations of iron and mineral acids.

The simple powder in a little cold water appears to be the most active form, the infusion in hot water the next, and the decoction appears to be nearly inert. This however is easily explained by referring to the chemical analysis of the fresh plant where it will be found that its active properties depend upon the presence of an essential oil or resin which is dissipated by heat. The combinations of hydrocotyle with other remedies do not appear to be so efficacious as the simple powder in small doses (gr. v.), an infusion of 10 grains of the dry plant or of 100 grains of the fresh plant, which was found to lose 90 per cent. of moisture in drying was ascertained to be a little too strong a dose for most of the patients, who complained of its causing uneasy sensations in the stomach. The syrup and the extract were not tried as there were no facilities for preparing them in hospital, and it was soon ascertained that heat applied to the plant in any of its forms deprived it of its active properties. The dry powder was applied locally by sprinkling it on bad or obstinate sores which it stimulated to healthy action. The particular forms of leprosy in which the hydrocotyle proved decidedly

efficacious were those accompanied with dry scurf, scales or eruptions on the skin and the cases with sores of any kind; in these the benefit has been most decided, though not of a permanent nature, as several of the cases which were discharged, cured, returned into hospital with fresh sores after the remedy had been discontinued. Sores of all kinds except lupus and cancer appear to heal under the use of this remedy. Several cases of gangrenous sores recovered under its employment. Lepra complicated with venereal disease is also benefitted by its use; but it appears to have no effect whatever in the tubercular forms of this disease.

An abstract of the cases detailed in table 1 may form a useful guide to those who are interested in the further investigation of this subject. Although we are willing to accord to Mr. Lépine and Dr. Boileau all the credit due for their unwearied labour in attracting attention to this substance as a useful remedy in leprosy, we cannot agree with them in considering it a specific for the disease, as some cases derive no benefit from its employment, and others are liable to a relapse when exposed to the exciting causes. We admit that the general health is improved in most cases and that the appetite and digestion become healthy under its employment, but further experiments are required to test the full efficacy of the medicine. The vellarine might probably prove a more powerful and efficacious form of administering the remedy.

Abstract of Cases of Leprosy in Table 1 *treated with Hydrocotyle.*

79 cases of leprosy treated, in 23 of these the sores healed and the general health improved, 6 of them left hospital in good health and 1 out-patient recovered.

7 cases without sores, the health improved.

3 cases absconded from hospital when out for exercise they were almost well.

6 well marked cases of tubercular leprosy derived no benefit from the treatment.

1 of tubercular leprosy got worse.

13 cases have shown no decided improvement.

2 deaths occurred, one from dropsy and the other from consumption.

24 cases now under treatment are progressing favorably.

The hodrocotyle asiatica has been employed for 5 months in the native infirmary and dispensary in the treatment of a variety of diseases; in many instances the beneficial effects have been well marked while in others it did not appear to be of any use. The diseases in which it has been found peculiarly efficacious are ulcers, syphilis and scrophula; nearly all ulcers have been found to heal under a course of this medicine, amongst the successful cases were a good many that had long resisted other modes of treatment. Lupus or cancerous ulcers do not appear to heal under its employment, though some cases did derive temporary benefit for a week or two after it was commenced. One case of scirrhus of the jaw that had gone on to ulceration left hospital much relieved, while another case that had not ulcerated, took on gangrenous action and proved fatal. Simple ulcers and common cutaneous eruptions are in general speedily cured by its use, syphilitic ulcers are also much benefitted, and sloughing ulcers are frequently stimulated to healthy action by having the dry powder sprinkled over them at the same time that it is administered internally. Two or three well marked cases of indolent scrophulous ulcers healed speedily under its use, one of these was the patient Abdool Russool who came into hospital with deep sinuses in the thighs and sores on several parts of the body which did not improve under ordinary tonic treatment, with nourishing diet, but the

sores all healed speedily however under the use of the hydrocotyle. Another patient named Seenevassem, who suffered from sinuses and sores of the same kind was cured. Several cases of obstinate syphilitic and gangrenous sores that had long resisted other modes of treatment healed rapidly under small doses of the hydrocotyle; one case of elephantiasis which had gone on to ulceration was cured and the patient left hospital with the leg nearly reduced to its proper size, a case of sea scurvy got soon well under its use. The remedy was administered in two cases of cholera along with spirits ammon. aromat. and appeared to act as a good stomachic, both cases got over the disease, but one proved suddenly fatal three days after her recovery from over exertion.

A good many cases now in hospital are deriving benefit from this medicine which can be recommended as a safe stomachic and tonic. It appears to have a peculiar action upon the capillaries of the mucous surfaces and skin, as it first causes a glow in the stomach, then a tingling in the extremities, and afterwards in the whole skin of the body: this is followed by an increase of the appetite and of the perspiration, and by general improvement of the health.

The following is the mode of preparing the plant for use; the leaves and stalks must be carefully separated and pulled to pieces as soon as possible after the plant is gathered. They must then be spread on a mat and dried in the shade freely exposed to the air; but not to the sun as this discolors them, artificial heat drives off a great deal of the aroma of the plant; 30 ℔s. of the fresh plant weighed 3 ℔s. 12 oz. when dry; of this the seeds weighed 2 oz. leaves 1 ℔. 10 oz. and stalks 2 ℔s. The seed have not so strong a taste as the leaves or stalk. When thoroughly dry the plant must be pounded and sifted. The ordinary dose of the powder

is from 5 to 8 grains to be given in cold water twice daily, and this appears to be the most active form of administering the medicine. The infusion of 10 grains in hot water and the decoction are not efficacious. The infusion of the fresh plant is very pungent and active. The powder sprinkled on sores often stimulates them to healthy action. The syrup is not so active as the powder. The baths and fumigations with the plant have not yet been tried, some large chemical apparatus has lately been manufactured in Madras for preparing the watery and alcoholic extracts, samples of these will be forwarded hereafter with a report upon their therapeutic action.

MADRAS, 28*th February,* 1854. (Signed) A. HUNTER, M. D.

N. B.—Several of Mr. Lépine's medicinal preparations have been made up from the fresh plant and have been found to be efficacious. A watery extract, a tincture, and the dry powder have been employed and will be reported upon again hereafter.

The first portion of the foregoing reports with the exception of the botanical description is a condensed epitome of Mr. Julis Lépine's remarks and experiments. The remainder and the tables are the results of observations and experiments tried with the hydrocotyle in the leper hospital and native infirmary.

(Signed) A. HUNTER, M. D.
Asst. Surgeon in charge of the Native Infirmary, Madras.

TABLE No. 1.

Nominal List of Patients treated with Hydrocotyle in the Leper Hospital.

NAMES.	Form in which administered and with what other remedies.	PERIOD. From	PERIOD. To	REMARKS.
Veerapen,	Powder and Decoction.	26th Sept. 1853.	....	Sores healing.
Putchay,	Do. do.	26th ,,		Do.
Adam Beg,	Powder and Decoction with Guaiac. Pot. Iod. and Liq. Pot. successively.	....	....	Sores healed, skin still thickened and tuberculated.
Ramen,	Powder and Decoction.	28th ,,	....	Sores slightly improved.
Moothoo,	Do. do.	28th ,,	....	Do. do.
Shutie,	Powder and Decoction with Acid Sulph. and Liq. Potassæ successively.	26th ,,	....	Slight diminution in size of tubercles, sores healed.
Millett,	Powder.	27th ,,	30th Oct. 1853.	Was improving when he absconded from hospital.
Ponnecamah,	Powder and Decoction.	26th ,,	....	Obstinate sloughing sores healed.
Miss McKay,	Do.	26th ,,	12th Nov. 1853.	No change.
Do.	Do.	8th Dec. 1853.	....	Slight improvement.
Moocunthoo,	Do.	29th Sept. 1853.	26th Nov. 1853.	Died of consumption.
Chellay,	Powder.	29th ,,	11th Nov. 1853	Was nearly well when he left hospital.
Cassaim Saib,	Powder and Decoction.	29th ,,	....	Ulcers are healing. Is much better.
Jagganaikloo,	Powder and Decoction with Guaiac. Pot. Iod. Acd. Sulph. Dil. and Liq. Potassæ.	29th ,,	....	Ulcers healed, tubercles in the same state.
Nagiah Chetty,	Powder and Decoction.	4th Oct. 1853.	....	Very slight improvement.
Vermoss,	Do.	29th Sept. 1853.	....	No change in tubercles.
Nooroydoo,	Do.	29th ,,	....	Health improving ulcers almost healed.
Casavaloo,	Do.	29th ,,	7th Dec. 1853.	Died of Dropsy.
Mootoosawmy,	Powder and Decoction with Guaiacum.	11th Oct. 1853.	....	A number of sores on body healed.
Goorooapah,	Do.	5th ,,	....	Fissures disappeared Health improved.
Chinnien No. 1555	Powder and Decoction with Pot. Iodidum.	5th ,,	16th Jan. 1854.	Absconded. Health improved had no ulcers
Minien,	Powder and Decoction.	7th ,,	....	Ulcers nearly healed General health improved.
Veneatasawmy,	Do.	7th ,,	19th Nov. 1853.	Left hospital with sores healed.
Do.	Do.	1st Dec. 1853.	....	Ulcers are now healed.
Rassamah,	Do.	8th Oct. 1853.	19th Dec. 1853.	Sores healed. Left the hospital.
Doorgen,	Do.	11th ,,	....	Ulcers improved.
Dumbee,	Do.	11th ,,	....	Ulcers healing.
RamasawmyNaik,	Do.	18th ,,	....	Ulcers healing. Fingers less contracted.
Boojaram,	Decoction.	18th ,,	....	Skin clearer, had no sores.
Ramasawmy,	Powder and Decoction.	18th ,,	....	Ulcer almost healed. Health improved.
Manr Chetty,	Do.	18th ,,	25th Nov. 1853.	Left hospital with ulcers healed.
Nursimloo,	Do.	18th ,,	....	Ulcers healing.
Mrs. Green,	Do.	18th ,,	....	Ulcers healing.
Do.	Do.	5th Dec. 1853.	....	Re-admitted. Ulcers healing again.

TABLE No. 1. *(Continued.)*

NAMES.	Form in which administered and with what other remedies.	PERIOD.		REMARKS.
		From	To	
Eliza,	Powder and Decoction.	18th Oct. 1853.	....	Had no ulcers. Health improved.
Haggerty,	Decoction with Guaiacum and Liq. Pot.	18th ,,	....	No change in tubercles, sores healed.
Trusberry,	Decoction and Powder.	20th ,,	18th Dec. 1853.	Ulcers healed.
Do.	Do.	22d Jan. 1854.	....	Ulcers broke out again.
Rungasawmy,	Do.	21st Oct. 1853.	....	Ulcers healed. Skin clean.
Mrs. Johnson,	Do.	25th ,,	....	Ulcers improving.
Ghonsee,	Do.	25th ,,	12th Nov. 1853.	Ulcers healed.
Do.	Do.	9th Dec. 1853.	....	Ulcers broke out again.
Yates,	Do.	24th Oct. 1853.	....	Ulcers healing.
Veerasawmy	Do.	18th ,,	....	Do.
Suares,	Decoction with Guaiacum.	30th ,,	....	Sores and health improved.
Calder,	Powder and Decoction.	29th ,,	....	Ulcers much improved.
Chinniah,	Decoction with Pot. Iod.	2d ,,	16th Oct. 1853.	Scales disappeared, had no sores.
Pye,	Decoction and Powder.	1st Dec. 1853.	....	Sores healing.
Chinniah No. 1552	Decoction with Iod. of Pot. acid Sulph. Dil. and Liq. Pot. successively.	8th Nov. 1853.	....	No change in the tubercles. Had no ulcers. Health improved.
Sopo,	Powder and Decoction.	26th Sept. 1853.	22d Oct. 1853.	Sores healed. Left the hospital.
Do.	Do.	9th Jan. 1854.	....	Returned back. Sores improving.
Palliatha,	Decoction and Powder.	26th Nov. 1853.	....	Ulcers healing.
Shunkeram	Do.	22d Nov. 1853.	....	Ulcers healing. Health improved.
Malliapen,	Do.	23d Oct. 1853.	12th Nov. 1853.	Sores healed, skin improved in appearance.
Yagah,	Do.	12th Nov. 1853.	....	Sores healing.
Dolamah,	Do.	21st ,,	19th Dec. 1853.	Left the hospital with sores healed.
Paulium,	Do.	11th Oct. 1853.	....	Getting worse.
Kistapah,	Do.	29th Nov. 1853.	....	Ulcers healing.
Miss Kick,	Do.	1st Dec. 1853.	....	Health improving, sores healing.
Gungah,	Decoction and Powder.	6th ,,	....	Sores healing.
Appah Naidoo,	Do.	13th ,,	31st Dec. 1853.	} Left the hospital, improved in health.
Kunnagah,	Do.	13th ,,	31st ,,	
Mahomed Saib,	Do.	15th ,,	....	Had no ulcers, slight improvement in skin.
Coomarasawmy,	Do.	15th ,,	11th Jan. 1854.	Absconded when nearly well.
Annasawmy,	Do.	19th ,,	....	Health improving, sores healing.
Veeranah,	Powder and Decoction	18th ,,	....	Sores healing.
Soobroyen,	Do.	27th ,,	....	Do.
Rose,	Do.	28th ,,	....	Do.
Susannah,	Do.	28th ,,	....	Sores nearly healed.
Permaul,	Do.	28th ,,	....	Sore healed.
Seethumberam,	Do.	29th ,,	....	Sore healing.
Cunthapah,	Do.	29th ,,	....	Do.
Subroyen,	Do.	2d Jan. 1854.	....	Slight improvement.
Narrainsawmy,	Do.	7th ,,	....	Do.
Meerapullay,	Do.	7th ,,	5th Feb. 1854	Do.
Puddavettah,	Do.	8th ,,	....	Do.
Veeran,	Do.	12th ,,	3d ,,	Do.
Boocheeramiah,	Do.	11th ,,	....	Do.
Asha Bee,	Do.	20th ,,	....	Do.
Sheemay Bee,	Do.	22d ,,	....	Do.
Vencatasawmy,	Powder.	22d ,,	....	Do.
Moothen,	Do.	30th ,,	31st Jan. 1854.	Do.
Muniapen,	Do.	10th Feb. 1854	....	Veryslightimprovement
Manivel,	Do.	10th ,,	....	Do

TABLE No. 2.

Nominal List of Patients treated with Hydrocotyle in the Naitve Infirmary and Dispensary.

NAMES.	Diseases.	Form in which administered and with what other remedies	Period. From	Period. To	Remarks.
Seenavasen,	Syph. Con.	Decoction with Potass. Iodidum.	2d Oct. /53.	23d Oct. /53.	Discharged cured.
Mootoosawmy,	Do.	Decoction with Decoc. Guaic. and Powder.	11th „ „	....	Sores healing slowly.
Yenkiah,	Rheum. Ac.	Infus. Vini. Colchici. and Mag. Carbon.	17th „ „	29th Oct. „	Discharged cured.
Chengelroyen,	Syph. Con.	Infusion.	17th „ „	24th „ „	Do. do.
Iyasawmy,	Scrophula.	Do.	17th „ „	29th „ „	Do. relieved.
Ungapen,	Do.	Infus. with Potass Iodidum.	27th „ „	12th Nov. „	Discharged cured.
Ragaven,	Ulcus.	Infus. c. Potass. Iodid. Decoc. c. Guaic.	5th Nov. „	14th „ „	
Do.	Do.	Do.	16th „ „	....	Ulcers healing rapidly.
Polliathan,	Syph. Con.	Infusion.	19th „ „	29th „ „	Discharged cured.
Veerahsawmy,	Do.	Do.	11th Dec. „	5th Jan. /54.	Do. do.
Ebram,	Scorbutus.	Powder with Acid Sulphuric dil.	25th „ „	2d „ „	Do. do.
Sied Akber,	Sphl. Prim.	Infusion.	19th „ „	3d „ „	Do. do.
Veerahsawmy,	UlcusGron.	Do.	23d „ „	20th „ „	Do. do.
Abdool Russool,	Atrophia c. indilent ulcusand sinues.	Powder.	2d Jan. /54.	....	Sores healed, general health improved.
Rungien,	Sph. Con.	Decoc. powder with Ferri.sesqui-oxydum and sprinkled on the sores.	11th „ „	....	Slight improvement.
Govindoo,	Do.	Powder.	16th „ „	10th Feb. „	Discharged cured.
Vellavanderum,	Rheum. ch.	Do.	17th „ „	20th „ „	Do. do.
Veerahsawmy,	Ulcusgrave	Do. and sprinkled on the sores.	31st „ „	....	Improving.
Ilyapen,	Syhp.Prim.	Do.	31st „ „	....	Do.
Rayapen,	Canc. oris.	Do.	31st „ „	21st „ „	Discharged cured.
Sied,	Syph.Prim.	Do.	31st „ „	....	Ulcers healing.
Mooneyan,	Scirrhus.	Do.	9th Feb. „	20th „ „	Died.
Mahomed Saib,	Boriasis.	Powder.	12th „ „	....	Skin clean and sores healed.
Ramasawmy,	Do.	Do.	13th „ „	....	Do.
Moonean,	Do.	Do.	14th „ „	....	Almost well.
Bava Kitchen,	Atrophiæ and chancre.	Do.	16th „ „	....	Chancres clean and healthy.
* Chinnien, Alloomall from last page.		Decoc. with D. Guai. and Potass Iodidum.	5th Nov. /53.	13th Nov „	
Do.	Do.	Decoc. with D. Guai. and Liquor Potass.	14th Nov. „	10th Jan. /54.	Discharged cured.
Arokeum,	Ulcusgrave eliphantiasis.	Decoction.	13th Oct. „	1st Nov /53.	Do. do.
Lutchmoo,	Atrophia.	Powder.	15th „ „	18th Oct. /53.	Died.
Seetha,	Syph.Prim.	Decoction with Potass and Iodid.	12th „ „	26th „ „	Discharged cured.
Soonthrum,	Do.	Do.	23d „ „	6th Nov. „	Do. do.
Rungien,	Ulcus.	Decoc. c. and Guaic. and Potass Iodidum	6th Nov. „	10th Jan. /54.	
Do.	Do.	Decoc. with D.Guaic and ferri sesquioxydum.	11th Jan. /54.	....	Ulcers healing.

TABLE No. 2. (*Continued.*)

NAMES.	Diseases.	Form in which administered and with what other remedies	Period. From	Period. To	Remarks.
Lutchee,	Scrophula.	Decoction.	23d Dec. /53.	8th Feb. /54.	Discharged cured.
Alloomalloo,	Syph. Prim.	Decoc. with Acid Sulph. dil.	21st „ „	13th Jan /54.	
Do.	Do.	Decoc. with D. Guaic. and ferri sesqui-oxydum.	14th Jan. /54	26th Feb. „	Ulcers clean and healing.
Lutchmee,	Ulcus.	Decoction.	23d Dec. „	26th Feb. /54.	Discharged cured.
Thunghoa,	Chol. Epid.	Decoc. with Spt. Ammon. Aromat.	28th Oct. /53.	30th Oct. /53.	Cured of Cholera died subsequently.
Polee,	Syph. Con.	Decoction.	14th Dec. /53.	8th Feb. /54.	Discharged cured.
Lutchee,	Do.	Powder sprinkled on the sores,	14th „ „	....	Ulcers clean and healing.
Sakeenabee,	Do.	Decoction.	22d Nov. /53.	29th Nov. /53.	Discharged cured.
Meenachee,	Ulcus.	Do.	30th Dec. /53.	5th Feb. /54.	Do. do.
Moonchea,	Suph. Prim.	Do. with Acid Sulph dil.	20th Jan. /54.	26th Feb. /54.	Improving.
Uncaemah,	Ulcus.	Infusion.	30th Jan. /54.	10th Feb. /54.	
Lutchee,	Do.	Infusion with sesqui-oxydum.	16th Feb. /54.	....	Slight improvement.
Putchay,	Syph. Prim. Cholera E.	Infus. c. Spt. Ammon. aromat tinct. opii.	19th Nov. /53.	22d Nov. /53.	Discharged cured.
* Chinnian,	Syph. Con.	Powder.	24th Feb. /54.	....	Slightly improved.
Alloomaloo,	Ulcus.	Decoc. with Potass. Iodid.			
Do.	Do.	Decoction with D. Guaic. and Liquor Hydriot. Arsen. et Hyd.	25th Oct. „	1st Nov. „	Continued above.
Nyncapah,	Ulcus.	Decoc. with Acid Sulphur. dil. and Powder.	21st Nov. /52	....	Almost healed.
Mooneesine,	Herpes.	Do. do.	27th Dec. /53.	....	Do.
R. Davis,	Syph. Con.	Do. do.	28th „ „	14th Feb. /54.	Discharged cured.
Yenkiah,	Rheu. ch.	Decoc. with Potass Iodidum.	10th Jan. /54.	14th Feb. /54.	Do. do.
Ramasawmy,	Do.	Do. do.	Do.	12th „ „	Do. do.
Mr. J. Rozario,	Lupus.	Decoction.	13th Dec. /53.	4th Feb. „	Do. do.

MADRAS, 28*th February* 1855. (Signed) A. HUNTER, M. D., 1*st. District.*

As connected with the foregoing report, it is deemed proper to record here the following letter containing the views and opinion of the Medical Board on the subject.

No. 142.

To

THE CHIEF SECRETARY TO GOVERNMENT.

SIR,

With reference to the order of Government conveyed in the Public Department No. 13, of date 4th January

last, relative to a requisition from the Colonial Government Cape of Good Hope for information on the use of the *Hydrocotyle asiatica* in the treatment of leprosy, I have the honor under instructions from the Medical Board to forward the accompanying report from Assistant Surgeon A. Hunter M. D., in charge of the Leper Hospital, together with a botanical drawing of the plant, six pounds of the dried leaves, a packet of the seeds, two ounces of the tincture, and two ounces of extract prepared by gentle heat.

2. During the last two or three months, the Board individually visited the Leper Hospital, with the view of personally witnessing the therapeutic effects of the hydrocotyle asiatica; from their examinations and enquiries they are of opinion it does not exert any specific curative powers on the constitutional taint of leprosy, though it appears to be a useful tonic and alterative; and to these properties may in some degree be attributed the beneficial effects that have resulted not only to some of those affected with leprous ulcerations, but to patients in the Native Infirmary suffering from cutaneous affections dependent on secondary syphilis and impaired state of the system from poverty and its attendants; however even in these cases where the benefit has been apparent, much must be attributed to general care taken of the patients as regards diet, cleanliness, rest, shelter, &c.

3. Government are aware that during the last several years many remedies have been brought to notice as possessed of peculiar curative properties in leprosy, such as certain preparations and combinations of iodine, arsenic, mercury, iron, quinine, madar, &c.; all however after thorough and long-continued trial have been set aside as *non-specifics* in this disease, though unquestionably in the incipient stage in many instances

their employment has been beneficial by renovating the constitution and checking, for a time the progress of the disease.

4. Fish liver oil it may be mentioned has been extensively used for the last two years in the Leper hospital, in the Civil hospitals on the western coast, at Secunderabad and other places with marked advantage; ulcerations, which had resisted other means of treatment, have healed under its use; and the fatty residuum obtained after filtering off the clear oil, has been also beneficially employed as a local application.

5. The Board however do not consider this oil to possess any specific properties, it probably acts as an alterative, and is decidedly a powerful nutrient in debilitated states of the body as evidenced by the marked increase of bodily weight that takes place in many patients while under its use.

6. In conclusion, with regard to the hydrocotyle asiatica, the Board respectfully beg leave to point out, that the plant would appear to be indigenous at the Cape of Good Hope; Burchell found it on ascending the Table land there, vide Travels in South Africa, Vol. I., page 42.

Madras, 6*th June*, 1845.

A. LORIMER, M. D.,
Secretary Medical Board.

MEDICAL REPORT OF MERGUI FOR 1853-54.

TOPOGRAPHICAL.

Mergui Bit; or mea, the southernmost province of the Company's territories, extends from latitude 10 to 13.15 N. and 79.30 to 100 E. longitude. It is bounded on the north by the province of Tavoy, on the east by the Siamese territory and also on the south where the

Packshaw river divides it from Bandapen, the Gola district of Siam; and on the west and southwest by the Mergui archipelago. The surface of the country is almost entirely covered with an impenetrable jungle, for the most part hilly, and plentifully supplied with water both from streams and natural tanks. There are apparently two principal ranges of lofty hills from 5 to 15 hundred feet in height intersecting the province, the one in a north easterly and the other in a south westerly direction almost parallel with each other and separated by the great Tenasserim river, which winds between them until it arrives at the town of Tenasserim where it is joined by the lesser river of that name arriving from the east; it then passes through a gap in the western range and reaching the low lands bordering on the sea, forms a number of small low flat islands covered with mangrove and scarcely fit for cultivation. The general aspect of the country, however, is very beautiful and although a journey up the Tenasserim river which may be considered the only inlet to the country does not present many scenes worthy the pencil of an artist, yet upon the whole the large hills rising as they do abruptly from the water with not a gap in their foliage except where the trees are covered with flowers or their roots are washed by the tide, cannot fail of producing a sublime effect; it appears as if the country had not been touched since its creation; upon inquiry, however, this does not seem to have been the case; tradition says that the channel of the river now difficult and shallow was at one time deeper so as to admit of large ships up the Tenasserim until by degrees filled up with sand and stones washed down from the neighbouring hills, and that a great king dwelt at Tenasserim which was then the capital, whose character appears like that of Pharoah the Egyptian; he caused thousands of people to make bricks and build a large

wall at their own expense, the remains of which now appear like a small range of hills about 3 miles in extent covered with jungle and amongst whose very bricks I saw a herd of Saumber crouching.

At Beyna Tenasserim, which is about 40 miles distant from Mergui, the character of the country changes and the river flows through an undulating valley many miles in breadth where it forms a number of islands which narrow the channel so as to produce rapids in the rainy season; indeed it has been stated to me by a burman that there is a place up the river from whence Ten yar dow or pinkwood of Mergui comes, which takes a month to reach from Tenasserim, but the rapids enable a man to return in 2 days as the influence of the tide only extends about 11 miles above that town. In this part of the country there are gaps in the jungle forming large plains of high grass, and forest trees are met with of a larger size.

Climate, &c.—A glance at the inhabitants of Mergui is sufficient to shew the healthiness of the climate: men from India and Bengal soon become more robust and muscular so as to be scarcely recognizable after a year or so as natives of those countries; this is greatly to be wondered at considering the inferior quality and great scarcity of food which is often experienced. The healthiness of the climate is no doubt in a great measure owing to its changeableness, the thermometer often falling 10 to 15 degrees in a few minutes in consequence of a squall or shower and making the temperature sometimes at midday less than that at 10 A. M. The accompanying extract from the meteorological register kept at this station will shew only one month in which there was no rain at all during the past year, and yet so much inconvenience from this is not experienced, as might have been expected; a shower

registering 3 inches or so by the pluviometer often drying up in an hour or two owing to the lightness of the upper stratum of soil in and about the town. The same table also shews the extremes of heat and cold (which I should mention are seldom above 88 or below 60, beyond these numbers being only exceptions to the rule) and the quantity of rain fallen in each month, I regret I cannot add the temperature of the dew point; all these peculiarities of the climate appear to render the country particularly favorable to Europeans, who have been some time in India and to whom the too sudden transition into a much colder climate might be prejudicial.

Natural Productions.—From the nature of the climate, the position of the province, its contiguity to the straits and Siam, it is natural to suppose that many of its productions would be identical with the productions of those countries; but the laziness of the inhabitants, and the unenterprising spirit of the few Europeans who have visited the place has as yet done little towards developing them. Their small endeavours appear to have been more confined to introducing plants and trees from other countries, relying upon the fertility of the soil to propagate them. Lately, however, some malays have discovered a large tree to exist nearly all over the province which is similar if not identical in appearance with the Gutta percha of the straits, and its gum answering to all the tests. They have not however the proper way of preparing the juice; the specimen I examined was not sufficiently deprived of water for any of the uses to which it is applied, it was too tenacious and sticky. In the same manner a tree resembling that producing the gamboge of Siam has been found a few miles up the river, but not apparently yielding sufficient quantity of the resin to make it worth the

while of the natives to collect the juice unless a more advantageous plan is adopted. I have not yet had an opportunity of examining the tree for myself but the assistant commissioner intends sending me the leaves and flowers which from his description appear to belong to one of the Garciniæ, probably that formerly noticed by Dr. Malcolmson of Rangoon; besides this there are many others of the guttiferæ used by the natives as a yellow dye and the dipterocarpus lævis or wood oil tree. Thorea ropustia or dammer tree and liquid camphor are found here; among the aurantiaciæ, we have only the pumelo and the common Indian lime in a wild state and another resembling the common lemon used in Europe.

The soil appears particularly favourable to the *leguminosæ;* all kinds of peas and beans when cultivated here flourish remarkably well; *cæsalpineæ*, tamarindus indica used here for preserving fish and as medicine by the natives and the sapan wood is plentiful. Pterocarpus indica called padok yielding gum kino, the wood is pink mahogany colour, and used for making musical instruments. Dolichos pruriens and also many beautiful flowering trees and creepers. *Amygdalæ*, a kind of almond is occasionally brought from the Salong islands; from the description the tree does not appear to be the same as that yielding the almond in common use, and the natives considered the nuts poisonous until a missionary pointed out that they were good to eat, they are said to be in great abundance; but I have not yet been able to visit any of the islands. There is a kind of oil here with a decidedly hydrocyanic odour, when agitated in water it imparts to it the property of giving a heavy white precipitate with nitrate of silver, but from want of materials I have not been able to test it further, the fruit from which it is obtained is called kan-zan and is used for medicine and food. I have

not yet seen the tree yielding it. There are several fruits peculiar to this province, as well as those found in other parts in great abundance, which would be excellent if cultivated; but the natives seem to prefer them as they are and usually build a house near some of the trees in the jungle, sit down and wait for the fruit. Myrtaceæ, a plant yielding cajuputi oil melaleuca Cl, I have as yet only obtained some of the dry leaves. Solanæ, datura stramonium, nicotiana tabacum appear to be indigenous, the natives say that their ancestors smoked from time immemorial. Laurineæ, a species of sassafras I frequently met with in the jungle near Mergui it is a small tree and the sassafras odour is rather faint. It is used in building. *Enphorbiaceæ*, Croton pavana, *Artocarpeæ* morus nigra not common and several species of ficus, similar to those in other parts of India; the juice of the f. religiosa is used here for gilding on paper. A tree similar to the upas tree of Java is met with at Tenasserim and used for the same purpose by the Kareens for their arrows and by the Burmese as medicinal snuff. Balsamæ, liquid amber, altingiæ *endoyenæ*, *palmæ* arenga saccifera yielding toddy, and sugar, leaves for roofing, areca catechu or betel, fan palm and Chinese flowering palm, &c., *Smilaceæ*, several species of smilax used by the natives as medicine. I have only seen one or two specimens, the rhizome of which appeared of a much lighter red colour than the Jamaica and having fewer of the rootlets attached.

Scitamineæ.—A plant belonging to this natural family is used by the siamese people to make a kind of arrowroot, which from retaining some of its aroma is an agreeable food for invalids. It was first brought me from the Lynea district; but I now find it to be very common and plentiful every where, although the Burmese do not know how to prepare it; it appears to be nearly the same plant as that called by the malabar people

putcha mungel who also do not seem to know its value. There are however three kinds differing only in the root and what the Burmese call malah-nee or red root of the first year is the only one fit for use; when properly prepared it is like fine ginger powder: as soon as possible I will send specimens of this with the plant in flower as well as of most of the other substances mentioned: also a species of cardamom. *Gramineæ,* the natives reckon a hundred and fifty varieties of rice maize Indian corn. *Algæ* a kind of moss used in the same way as Iceland moss (gracillaria); fungi very numerous and many of them strange to say used as food by the natives.

FAUNA.

We have among the Carnivera tigers in great abundance and two or three kinds of tiger cat. It is remarkable that the tame cats of this province have all a deformity in one or several joints of the tail. The Malay bear, a kind of wild dog when tamed used by the natives in hunting. The monkey tiger, the civit, &c., the insectevora, the musk rat; of the quadrumana, there are a great variety: the black and yellow gibbon large and small; the white eyelid monkey, the fisher monkey and many others amongst which I have once seen and heard the barking monkey, it is about 18 inches high of a blewish grey color with a little white about its face. I mention it particularly as I believe it is very rare. The *rodentia* are very abundant, several kinds of squirrils and jungle rats, one resembling the American grey squirril. Rats and bandicoots perhaps even more abundant than in other parts: two species of porcupine very plentiful and two of the flying squirril. The chiropera in great numbers amongst which are the flying fox, cave bat, &c.; of the former I have seen more than a dozen from one nest, the Burmans are very fond of their flesh as food.

Pachydermata.—The wild hog is very plentiful, the elephant; single and double horned rhinoceros are occasionally met with in the interior. The Malay tapir has been mentioned by several Europeans who have visited the place. I have not seen it or its marks nor can I meet with any jungle people who seem to be aware of its existence.

Ruminantia.—We have several kinds of deer particularly elk, ghee and mouse deer. Of wild cattle the natives consider five kinds, the wild buffalow, Indian bison, a small wild cow of a red color, and a large kind dark red with white on the hind quarters called by the Burmese tschine, the fifth kind if such there be, I have not seen, possibly the *neilgi,* or a cross breed between a pegu poney and a sambur. A figure of which is on an ancient lead Tenasserim pice now before me. This doubtful animal is called May how.

Icthiology.—Among the fish I have noticed the cat fish, the Indian mullet, mango fish, two kinds of Indian pomphlet, black and white, very plentiful and fine, the saw fish and sole, differing a little from the English being narrower in proportion to its length but of much the same flavour, the shark, the hammer headed shark, the thorn back and the trunk fish. There is a kind of fish very much resembling the mackerel both in size and appearance, also a large bony fish much eaten by the natives with a strong flavour of mackerel: another fish resembling the lamprey and another the whiting; on the whole the eatable fish have much more flavour than those of India. Besides these there are several sea monsters scarcely describable.

Crustacea.—The large clawed crab, the king crab, the hermit, the mantis crab, and the fresh water cray fish. The prawns do not here obtain the size they do in India, when very small they are used for making a

substance called *ngape* which consists of these and other small fry in a half putrid state mixed with salt, chillie and some acid fruit, and invariably forms a part of a Burmans meal in these provinces.

Reptilia.—Chelonian reptiles are most common, land tortoises of several varieties and of turtles five or six kinds among which are the hawksbill turtle, the snouted kind, and one resembling that used in England; most of them are very good to eat, some are better than others. At this season of the year numbers resort to a certain sand bank or island up the Tenasserim river and near the town for the purpose of depositing their eggs. This sand bank was formerly farmed out by Government for the profit of the eggs which are much esteemed both here and at Moulmein, but lately the privilege of taking the eggs has been thrown open to every one. The sancian *reptiles.* Alligators, ignanas, large brown lizard, bright red and green spotted lizard called by the natives torolita from the noise it makes, who consider it unlucky if one dies in the house. The common gecho, many varieties of blood suckers or chamelion lizard of beautiful shades of color, a grass green lizard, a bright orange and green one and the flying lizard. Draco fimbriatus. *Ophidian* reptiles both land and water many unknown species said to be very venomous. I killed one day a small blood red snake which is said to have killed three men in this town. I once met with a pretty one marked with triangular patches of vermillion, green, and blue. The hyrna driadeæ are very common and I have frequently met with a cobra, whip and carpet snake; they have seldom been known to bite in those provinces and are said to be less venomous than the same species on the other side. I have only noticed a small kind of scorpion and its sting is not very severe.

Myriapeda.—Centipeda, millipeda and gigantic millipede. Among the *radiata* we have a few insignificant specimens of the polypiferous and poriferous classes; but some beautiful corals are brought from the neighbouring islands in the boats which are loaded with the sea slug for the Chinese market and we have the star fish, several of the medusæ umbrellæ, jelly fish. The neighbouring pools and rain water tanks abound in animacules well worth the while of a microscopist to examine, and many of them resembling those met with in England as monoculi gordicss Aq. and some beautiful volvoces. *Conchifera,* although many rare shells are to be procured at the distant isles, Mergui itself is very poor in specimens, all that can be had are ostea edules two or three wholesome varieties, margarite musel, common cocles, razor shells and one or two bivalves, from nearly all of which the natives obtain seed pearls; two or three whorls and one or two kinds of land snail which the inhabitants eat.

Entemology.—Perhaps there is no place where so many varied and beautiful specimens of the different insect tribes are to be found. This is no doubt owing to the peculiarly moist and hot climate producing as it does such a vast amount of foliage as to afford protection and food to countless myriads.

The *Coleoptera* are the most numerous and beautiful, so numerous as to make it endless to describe them in a report of this nature. The size of those in my collection vary from the rhinoceros beetle of 3 inches in length down to a perfect beetle as small as a pins head, some of the most beautiful are varieties of the stag, springing and golden turtle beetle.

Orthoptera.—The cricket, mole cricket with several varieties of more brilliant colors than are usually seen, two or three kinds of locust, the mantis, the praying

mantis and many of the *phasmida* some resembling small bits of stick decayed leaves, &c., in a most startling manner. *Nemoptera.*—Endless varieties of libellulæ of brilliant scarlet and blue colors.

Hymemptera.—About six varieties of ants the most troublesome perhaps is a small black ant I believe peculiar to these provinces. Its bite produces sometimes formication all over the body. A great number of bees, a solitary one building in a small nest not much larger than its own body. The wasps are very troublesome, one kind apparently only coming out at night and usually to be found in the candle. Another variety has its body striped with crimson and mazarine blue, hornets, are in great abundance and their sting severe.

Lepidoptera.—Are also numerous and beautiful; but I have not found many that were not in the collection I made at Moulmein, perhaps the most remarkable are those that have marks upon them as if their wings were silvered and gilt, one specimen of so delicate a nature that it cannot be touched much less caught without all its beauty being destroyed.

The *diptera*, are perhaps as numerous as those belonging to other orders. Although scarcely so interesting there are however a few as brilliant as the butterflies alluded to above, even the musquitoes have gayer feathers and are more troublesome, and the sand flies and others are numerous.

ORNITHOLOGY.—*Raptores.*—I have not met with any of the Vulturidæ probably their offices are not so necessary here as in some other countries, decomposition taking place somewhat more slowly on account of the extreme moisture of the air which at the same time prevents the effluviæ from spreading very far from any carcase, while the torrents of rain during the greater part of the year soon wash it into the soil. The

Chinese vulture has been mentioned by some one as an inhabitant of these regions; but although I have seen six or seven carcases together of dead buffaloes during the late epidemic among them, I have not seen any bird at all resembling a vulture. I have seen in the cold weather an eagle near the sea which I suppose to be the white headed eagle, haliactus leucocephalus, and a large fishing hawk is common; different kinds of falcons, the common Indian kite and the brahminy; *strigidœ* or owls are numerous amongst which I have noticed the great horned owl; a small kind of owl which has many times deceived me from its call resembling that of a human voice asking a question and then after a pause another answering it in the same manner, and a gigantic owl so large as to have been mistaken by my guide one evening for a deer.

Passerine.—The goat suckers or night jars.

Caprimulgidœ, are numerous and beautiful. I have preserved one beautiful specimen whose beak is red lined with yellow the quill feathers of a deep ultramarine blue with a patch in the centre of each wing of a light green, the tail of the same color tipped with black, the rest of the plumage of a brilliant green with the exception of a patch of bright blue under the throat, its gape is enormous; the tarsi are not feathered, this at first led me to suppose that it belonged to the allied genus of podargus; but I find it has pectination on the under edge of the nail of the middle toe, there is another species with two long appendages resembling those of the leona goat suckers but I have not yet obtained a specimen. Hirundines the common swallow here differs slightly from the European, and we have the hirundo *esculenta* which is very plentiful in the neighbouring islands. I have seen the best variety of nest sold here for twice its weight of

silver; *todidœ* several specimens belonging to this family, *halcyonidœ* four kinds of kingfishers one differing a little from the European variety, another of large size with the whole upper surface metallic blue, and the under silver white, and the beak black, a third, upper surface mazarine blue, throat and under parts orange and white, the fourth has the same colors reversed; these two last are apparently male and female, the beaks and legs in both are scarlet, the feathers are taken to China and sold for a high price.

Dentirostres.—Of the *Laniadœ* or shrikes, we have endless and beautiful varieties, swallow shrikes, fork tailed shrikes, the fairy shrike, irena puella, another with a bright cobalt blue beak, under surface and upper tail coverts deep crimson with a bar of black across the throat, greater wing coverts yellow, scapularies white, the rest of the plumage black. Fly catchers *meescieapidœ.* Tyrannus M. muscipeta paradisi, and others; *sylviadœ,* we are most rich in singing birds, besides bulbuls, Indian black cap, &c., which differ slightly from those on the other side, there are many even superior in song to my taste, some are so small as not easily to be seen amongst the leaves and yet their voice very powerful and enchanting. There is one large bird apparently a kind of thrush of an olive green color with a most superb note resembling a high toned flute. Conirostres, the common Indian lark, alanda gulgula. A bird resembling the St. Helena canary in note and appearance. The Indian weaver bird or baya, ploceus philippensis, the common sparrow differing only slightly from the Indian Java sparrow, &c., I have only noticed one kind of starling of the genus pastor pagodorum, black with bright scarlet eye; some hundreds breed every year in the jail wall; most of the above mentioned birds as well as some afterwards to be mentioned are migratory,

and the larger portion only to be met with in the wet season, this renders it difficult to preserve them.

Corvidæ.—Ravens, Crows, &c., one or two pretty varieties of the magpie, a beautiful blue jay, corvus varians, &c. *Enlabes,* the common minah, the talking minah, gracula religiosa and another differing slightly from the hill minah of India.

Buceridæ, the rhinoceros hornbill (buceros R concave B eavatus) and a gigantic one feeding on fish as well as fruit. *Tenirirostres* black and blue honey sucker (nectariniæ eyaneæ) yellow bellied sun bird (einnyris lepida) a scarlet headed and several other varieties are common. I have one specimen with all the colors that can be imagined, there are also several kinds of meliphagidæ. I have never met with the hoopoo in the place, I have often heard the voice of several kinds of cuckoo, but do not know to what species they belong. Some natives describe to me one of a green and yellow color laying its eggs in another nest, but the only one I have seen is the chestnut or pheasant crow, which is very common here and called by the natives "tide crow" because it is supposed to indicate when the tide has turned; several kinds of trogon are common here, one of a bright metallic green, another of a bluish grey color; the woodpeckers are interesting and numerous, there is one resembling the ivory billed woodpecker of America ("picus principalis"). I have preserved a very beautiful small variety with a scarlet head, and another with a patch of scarlet in the centre of its back merging into gold color to the wings which are refulgent gold and green, so brilliant that when the bird is flying it has the appearance of a flame of fire. Psittaridæ, green parrot, Malacca parrakeet, and the red lorikeet.

Gallinaceous.—The ring dove, the turtle, ring neck or collar turtle, and a rufus colored dove are very plentiful at some seasons; a pretty kind called the Malay dove is occasionally met with, it is very small and of a delicate flesh color, bar red all over except at the breast with pencillings of brown; its coo is like a low gentle whistle; there is also a superb variety which is called by some the green dove or solitary pigeon; but I have never seen it except in pairs; the head, neck and breast are red and purple with patches of white and blue, the back and wings are of a most brilliant emerald green with pearly reflections, its flight is low, horizontal and very rapid, it is not very common. Besides the green pigeon of India we have a large wood pigeon with the whole of its plumage, except the head and breast which are ash grey, of a bright rich green with coppery reflections, perching on the tops of the tallest trees and feeding exclusively on fruit; it is very good to eat and when cooked is about the size of a plump partridge. There is another pigeon not so common but quite as large with a white head, green and bluish wings, black tail, the rest of the body maroon color. From the Salong islands too I have received a very pretty cream colored dove with the pinion feathers jet black, and a kind of pigeon fowl which also inhabits the southern side of this province, it somewhat resembles the Nicobar pigeon, but is much larger: its habits are terrestial and its feet like that of a fowl but destitute of spurs, the head and anterior part of the body are like a pigeon, round its neck it has golden hackles like a cock, the rest of its plumage is of a beautiful dark bronze green and black, it is about the size of an ordinary fowl.

Phasianidæ.—Our pea fowls differ from the Indian and resemble the Javanese in the imbricated feathers

of the neck and chest, (pavo javanieus) the jungle fowl is the same as the Indian but perhaps smaller. Although we have bantams, dwarf fowls, malay fowls, and other varieties, there do not appear to be any peculiar to Mergui, cxeept perhaps the coifre or ruffled feathered and the tailless fowls, I am not sure that they are but I eannot trace their origin; this latter variety seems almost an advantage of development; they are certainly more lively and courageous in battle than those who have the tail to turn; the absence of the parson's nose looks rather peculiar at table.

No true pheasants are to be found here, but the argus, A Gigantia and the Impcyan pheasant are found inhabiting the hilly parts in the Linca district towards the Siamese side of the province.

Tetraonidæ.—The common quail and the Mergui crested quail which resembles the Callifornian.

Struthionidæ.—I have not met with any bird of this family, but two or three Birmans to whom I was showing some prints exclaimed on seeing the representation of a dodo, that they knew the bird well and that it might be eaught as it could not fly; the Birmans are indolent observers and their deseriptions of course are not much to be relied on, but as their religion forbids them to kill, such a bird might have escaped destruction where it would not in another eountry and I am still prosecuting an enquiry as to what bird it may be, the place where it is to be seen is many days journey from this.

Grallatores.—Golden plovers, dotterels, &c., in abundance and harnantopus a species of eranc. Herons storks, &c., a gigantic species of cieonia very sly and wild, ibis and the adjutant, *scolopacidæ* —eurlews, sandpipers, snipe and painted snipes in abundance.

Natatores.—The large grey duck; grey wild goose; the large manilla duck is common and from its handsome appearance is often domesticated; whistling teal are to be found in the same tanks but not so abundant as in India. *Pelecanidæ,* the white pelican, palecanus onocrotatus and the darter or snake bird are to be seen in the Tenasserim river.

Geological and *Mineralogical* observations; researches of this nature are here attended with great difficulties on account of the density of the jungle and the jealous unwillingness of the inhabitants to guide one to the denuded portions of the hills or streams where any minerals can be seen, being under the impression that I am seeking for gold mines, &c., which the pungies tell them will immediately be seized upon by Government. Any minerals that are found by the jungle people are given to the pungies some of whom are still trying to find the Philosopher's stone, the consequence is that I have as yet been able to procure but very few specimens for the Madras museum in compliance with the circular letter I had the honor lately to receive. From the small researches I have been able to make, the following is the brief result. The prevailing rocks on the western islands and in the hills towards the interior are of the primary series granite, gneiss, porphery, &c., in which are beds of mica and clay slate, felspar and quartz; the latter containing milky quartz and flesh colored felspar as at kings island. Quartz is here as in other countries the most abundant mineral and the hills of Kuay koe in the Kuay river and the larger hills on both sides of the Tenasserim river beyond Kahau, as far as Tenasserim seem composed for the most part of a rock of this nature. At Tenasserim, primative limestone, quartz and clay slate are met with and the large hills at a little

distance from the town are composed of granite. The inhabitants do not seem to be aware of this and when showing me an ancient monumental column composed of this latter stone, told me that the people of old made it, they supposed by sticking little pieces of stone together; when I observed to them that such could not be the case, they told me it must have been brought in ships for they did not see any stone like it near. In the sand of the river too, are found occasionally by the old women when fishing, small red and yellow stones which on examination I found to be garnet, topaz and octohedral ruby, crystallized and in rounded grains, no doubt washed down from the neighbouring rocks. Mergui itself however, the adjacent hills and Patan island seem composed of sand stone containing a large amount of iron, pieces of quartz, and at Bittang or Mergui hill, small rolled blocks of granite and limestone interspersed. The level ground is composed of a good red loam beneath which is gravel, and on the lowlands near the sea quartz sand under which is blue marl. Beyond Tenasserim, the transition and after passing a large alluvial tract, tertiary formations are seen and amongst them large coal fields. The first specimen I examined was brown coal, not easily ignitible, but burning tolerably and leaving a small quantity of ash. I lately examined a small specimen brought from Tenasserim which the Burmans told me was of no use, but which I conclude to be pitch coal or jet; it is of a velvet black color, massive with a woody texture, splendent and resinous fracture, large perfect conchoidal fragments, sharp edged and indeterminate angular; opaque; soft; streak, brown colored; brittle, does not soil; sp. gravity 1.3 exactly, and it is capable of receiving a high polish. A kind of coal is said to be found at Tany-det but on reaching that spot I was informed that it was a day's journey further

in the interior or karen jungle and that Captain Birdmore who had previously examined it, considered it to be of an inferior quality. Some time since I was shown by a pungie, some chalk in which was an echinus and a terebratula, who wished me to tell him the name but did not know from whence they came and to-day I received a large flint echimus from Penday.

From the nature of the above mentioned rocks it is natural to suppose that the province is rich in metalliferous deposits, and accordingly gold is found in the sand of the lesser Tenasserim river just above the town though only to a very small extent, in small flattened grains. The Burmese account for this as well as for the presence of the gems mentioned above by relating the tradition, that in ancient times a rich shan having chopped up all his jewels threw them into the river to avoid their being seized upon by the king. In the Siamese territory bordering upon the Company's at a place called Bandapan there is an establishment and a guard placed there by the king for collecting the gold which is said to be in considerable quantity and has the reputation among the Burmese of being the purest that can be obtained. Several people have had the good fortune to pick up pieces of gold in different parts and at the northernmost village of this province a jungle fowl was one day killed and found to have a piece of gold in his gizzard. That gold is found to a profitable extent, although the exact localities are sedulously concealed seems evident too from the fact that it is somewhat cheaper here than in India; gold of what is here called eight and half touch, and I find to be about 19 sp. gr. being purchasable at from 22 to 26 Rupees the tecal, according to the desire to obtain or exchange it for money, and this is cheap when it is considered how natives generally wish to concentrate their wealth for convenience, and to prevent

being robbed and when here diamonds, rubies, &c., obtain a supposititious value far above their real for this reason. Copper ores are occasionally met with and from near the coal fields, I obtained a piece of the radiated blue copper. Iron is very abundant almost every where, particularly on the northern side ; the most important ores I have procured are the common magnetic, granular magnetic, scaly red iron ore and brown hematile, but tin is the only metal that at present is worked. It seems to be extensively spread throughout the province and there are remains of old works if such they may be called at Packshan on the southern boundary and at Kahan about one tides journey from this consisting simply of small pits dug in several places without any discrimination ; at the latter place it is found in gneiss after the removal of some sand and mica in which there is iron, and also in an alluvial form at the foot of the hill ; the largest quantity is found in a plantation on the southern side of Kahan hill in small nests or patches spreading nearly north and south ; but the real vein seems yet to be found and by digging deeper. The ore is much the same as the cornish tinstone or oxide of tin, but yields only about 72 per cent. of tin and generally from want of care in the process here not so much is obtained. A kind of graphite containing iron and mixed with small pieces of iron pyrites is sometimes sold here for tinstone, by detecting which I saved an ignorant agent from being cheated to a large amount. I have evidence too of the existence of a mineral spring from some pieces of clay mud and sticks highly impregnated with sulphurous vapour brought me from a piece of water ten days journey beyond Tenasscrim by an innocent Burman who had used them in his curry ; he described every thing around the water as being blackened and plants killed by its effect.

Population.—The province although containing only about thirty thousand in number is inhabited by no less than eight distinct races, each speaking a different language, Burmese, Chinese, Malays, Karings, Teleings, Shansalongs, Siamese and Salonese and having each separate villages or collections of huts in the jungle peculiar to themselves, except the Salonese and Shansalongs who live in boats among the islands. Besides the above mentioned, there are a few European anglo indians, portugese indians, Bengalese, Coringa and Madras people; the children of intermarriages between all these and Burmans and a large number of the descendants of Mussulmans who live in separate villages, but retain very few of the prejudices of the Mussulman.

The Burmese, Chinese and Malays are now too well known to need description, but the Karings of which there are two castes are such an interesting people that I regret I have not seen much of them, only a few come occasionally to hospital when down here on business. They are a fine athletic people with sometimes almost an European complexion; they have a better facial angle, more real intelligence and are more civilized than the Burmese from whom they entirely separate themselves, always living higher up a river or creek, in deeper jungle, nearer the hills, many hours journey from any Burmese habitation, and where it is too cold for the Burmese to remain. They change too their abode every year, except a few who have good gardens and even then never plant their paddy in the same place twice or return to a spot where any of their relatives have died. The women have a much more feminine and modest look than the Burmese, and their feet and hands are smaller. Their dress consists of one long thick robe fastened round them like the Burmese, and over this they wear a jacket like that of a Chinaman, but sewn in one piece without any fastenings; the material is

usually a handsome thick cloth of brilliant colors. Round their necks they wear beads, cowries, coins, charms, &c., and in their ears large bunches of green leaves., The dress of the men is the same with the addition of boar's tusks round their necks, some of their state dresses are very handsome. Their mode of living is much better than the Burmese for while they live like caterpillars upon every kind of flower and green leaf, the Karings cultivate vegetables and breed poultry for their own use and for sale, they plant their paddy at the foot of the hills. The Teleings I have only once seen, one or two families were passing through begging their way to Moulmein by playing music at every house which was certainly more harmonious than the Burmese, they were returning to the country from whence they had been driven by the Burmese before the English took possession. They resemble the Siamese and wear short hair.

The Salonese and Shansalongs too are only seen here occasionally; they come in lightboats made of native cork in which they live and wander from island to island, one or two have been brought here when wounded by the Malay pirates who are now becoming very troublesome and even attack Burmah boats high up the Tenasserim. The Siamese live for the most part high up the river, so that in fact a population of only thirty thousand is scattered over a country of about two hundred miles in length and nearly a hundred in breadth, the largest collection of people and indeed the only considerable one being at Mergui, the only place that can be called a town and it scarcely deserves the name being composed of a collection of villages each with a separate named around a hill on which are three or four European houses and the cantonment; the whole with some surrounding jungle separated from the main land by a creek which forms it into an island con-

taining a mixed population of about nine thousand, whose habits and customs are essentially Burmese. The cantonment is situated on the eastern bank of the Tenasserim river near its mouth overlooking the town, Bazaar street and river; it faces a small island without name about four miles in length composed of two fine hills called Potan and Peteit joined by a piece of lowland; and commands a view of Tavoy and king's islands. The entrance to the river at this part is somewhat difficult, and this difficulty has lately been increased by the rapid formation of a sand bank between the Potan and the eastern bank of the river, still by the protection which Potan affords from the south west monsoon it forms a tolerably safe harbour for ships of two or three hundred tons. The commerce however is so very small that nothing but two or three junks or Burmah boats ever enter. The river at this point is about a mile and three quarters in width and the tide rises about eighteen feet leaving at low tide a large quantity of mud which sometimes produces very fetid effluvia; but does not seem to affect the health of the inhabitants.

Mergui contains besides the barracks, military hospital, magazine and commissariat stores, a jail containing about 200 inmates and a small civil hospital which has been lately so well attended on account of accidents, fights, dacoitees, &c. that it was found necessary to enlarge it. The general health of the inhabitants is good, considering the coarseness of their food which consists of rice, a little salt fish, and almost every product of uncultivated vegetation within their reach, they even persist in eating a kind of large bean growing on a large jungle tree, which according to their own account bears always one poisonous bean which usually makes a man ill for three days and will kill a child within 24 hours. Only a few days ago I was called in just too late to a child of 5 years old

who had eaten two the day before. The effects of the poison resemble those of strychnine. Intentional poisoning is very common, generally from motives of jealousy and for this reason they do not use arsenic which is very plentiful in the bazaar, but opium; they usually send in time so that no death has occurred from opium during the last year.

The diseases to which they appear most liable are neuralgic pains in the stomach from over distention and consequent weakness which from continued attacks and the use of indigestible food and the treatment of native doctors sometimes leads to ulceration and perforation; a mild form of intermittent fever and obstipatio. Even the food eaten here by Europeans is of an inferior quality consisting chiefly of fish; vegetables and spices which are cultivated by the Chinese; fowls and ducks. The bread is very inferior, beef, butter, &c., can rarely if ever be procured and then of an inferior quality and at exorbitant prices. Sheep will not live here. This would appear to be a great draw back to Europeans coming to this station for the benefit of their health; but should this be thought, expedient arrangements could be made as formerly for the supply of beef, &c., as the surrounding pastures are very good.

Para 2.—*Position of the barracks, &c.*—New barracks and hospital were finished soon after my arrival at the station, in the situation of the former ones, namely, on the furthest declivity of a hill which faces the river, so that the top of the hill on which there is a road intervenes between them and the river and reaches up to about a level with the windows, still the situation appears to be healthy. The buildings are of wood, raised from the ground on pillars of chunam about 3 feet high and thatched with leaves.

Para 3.—Duty on employment has been comparatively light and has in no case been productive of illness.

Para 4.—Average strength, &c.—From the 12th of January 1853, a detachment of the 26th N. I., garrisoned Mergui with 86 men and one officer, this was relieved on the 27th of June 1853, by a detachment of 30th Regiment N. I., consisting of 87 men and 2 officers who remain at the present time, no one has been transferred sick.

Para 5.—Remarks on the principal classes of diseases, &c.—No particular disease can be said to have prevailed and while the natives of the whole province have suffered severely from fever, general swellings and cholera, the detachment has experienced a remarkable immunity from sickness. One death however has occurred in I think a rather unusual form of disease to be related hereafter. Of fever there have been 23 cases for the most part quotidian, and yielding to treatment with one or two exceptions in a few days. One case only was a little obstinate owing to extreme debility from former attacks. The subject was a private, native of Bengal, of 13 years service and his attack of the tertian variety; he at last recovered by the persevering administration of quinine with occasional alteratives and a full dose of Dover's powder before the cold fit. The general treatment in most cases was, that I believe usually adopted by others namely, on admission P. jalapa co. or if the stomach be overloaded an emetic followed by salines with small doses of tartar emetic for a day or two and then quinæ grs. two or three with acid sulph. dil.; after the fever has ceased for a day or two I usually substitute quassia or other tonics to economise the quinine, very often however, when the patient has had previous attacks I have given the quinine on admission without any preliminary treatment except perhaps a purge, and I am led to believe that they were able to return to their duty sooner than if previously depressed. I did

not use sulphate of iron in fevers not having found it beneficial in the civil and jail hospitals; it appeared to produce increased congestion of internal organs and one or two patients asked for quinine well knowing the difference.

Diseases of the stomach, bowels, &c.—One or two cases of colic not severe and yielding to opiate fomentations calomel and opium, without depletion. Cases of dysentery have been few, mild blue pill, ipecacuanha and opium, and after the first stage nitrate of silver have been the remedies usually employed. For diarrhœa I have used pul. ipeac. co. after the operation of ol. Ricin and tinct. opii. When the diarrhœa has been protracted, tincture catechu co. with the infusion or if this failed, acid sulphuric dilutum M. xv. three times a day. Under the head of *rheumatism* most of the cases were in reality, only slight pains yielding to warm or vapour paths, dover's powder and liniments. Some however required salines and antilithics, but only in one case of extreme pain was I constrained to use colchicum. This was an old rheumatic subject with remarkably large feet and hands, thick lips and slight simple hypertrophy of the heart, but apparently no further disease of that organ; he was admitted with great pain and swelling in both fore arms and hands, occasional pains all over the body, furred tongue, full quick bounding pulse and high colored urine, depositing lateritious sediment. He recovered and was able to return to duty in two weeks under the following treatment.

The affected parts were enveloped in thick cotton removed only occasionally for drying, and salines with tartar emetic and colchicum were administered for three or four days when the pain was relieved, after which tincture digitalis in combination with opium were substituted to relieve the heart symptoms.

Para. 6.—A detailed narrative of any Epidemic, &c.— During the past year no epidemic has prevailed among the troops at this station. An epidemic attack of cholera however made its appearance among the natives at the latter end of October and spreading throughout the province lasted during November and the beginning of December, detailed accounts and returns of which were sent in to the civil department of the Government of Bengal. The following appear to be now the only circumstances worthy of report in the attack of this too well known disease.

1st.—This disease which has not visited the province since 1842, was said this time to have been propagated by a man who had arrived from Moulmein, where the cholera was then raging and it is true that he and some others who arrived in a boat from Moulmein were the first attacked, but as no others were attacked until some days after his death, and as the wind continued to blow in a direction from Moulmein and the cholera spread from that side of the town to the other and on to the villages in the interior in succession remaining at Tenasserim and the Karing jungles and then going southward to the Linca district long after it had ceased here, it is as easy to account for its propagation through the air.

2d.—The influence of fear and irregular mode of living in promoting an attack, no doubt often noticed before by others, seemed here peculiarly exemplified amongst a people who had not seen this disease for so many years. Cattle, paddy fields, gardens and houses were deserted, no one in the town would work, they deserted their relations when dying, so that I sometimes entered houses and found people who had been dead sometime without any one knowing, and gave themselves up entirely to a mad kind of revelry called devil dance, shutting their houses at night, often not

allowing me to enter, after sun set and firing through the roof. Scarcely a boat went out fishing during the epidemic and it was only these people who were attacked; while on the other hand the sepoys and inmates of the jail, to whom it was nothing new to hear of such things, kept at their regular work and diet, and escaped. Nine persons, however, were attacked in the jail, but with the exception of one they were men who had not undergone their trial and who were receiving food from outside. Four died, three of whom would have been hanged otherwise; which still seems to show I think the influence of the mind on disease; the want of electric equilibrium too which was much talked about in England when I was there during the last attack three or four years ago, was experienced here, for it was remarked by every one that we had not had our usual amount of thunder and lightning at that season of the year, the weather was unusually oppressive and hot. The meteorological register shows for November 1852, thunder and lightning eight times and for the same month 1853 only once, and although this seems very slender evidence still it may be as well to mention the circumstance as it might tally with the remarks of others, that on the 23d the only day in the month when there was thunder and lightning, there was only one death from cholera in the town, whereas the day before there were nine.

3d.—The comparative mildness of the attack seems evident from the following return taken from those attended by me without the interference of native doctors and others, yet under the adverse circumstances of the difficulty of getting attendants to apply friction, &c. or even to go near them to give the proper food and medicine. Some of these even killed themselves immediately they were able to eat, by consuming hard rice and green cocoanut water. Deaths 64, recovered 135, total 199.

My treatment does not materially differ from that I believe now usually adopted. In the first stage or diarrhœa, calomel and opium in small often repeated doses; if vomiting be present creosote, lavender, brandy, catechu and ammonia to support the strength and check the diarrhœa ; as the other symptoms appear, large draughts of cold water with a little brandy to allay thirst and in the approaching state of collapse, friction ; strong liniments and the application of hot bags of sand to the cold parts of the body ; emetics of salt or mustard and water to excite the hearts action.

Para. 8.—The experience of all my predecessors at this station has been so much against it that I have not once attempted to vaccinate. Fortunately no evil result has occurred, the detachments all of whom have been vaccinated being often relieved and every precaution short of a quarantine having been taken to prevent the admission of small pox into this town during the time of the epidemic at Moulmein.

Para. 9.—*Remarks on such cases, &c.*—There appears now only one case worthy of remark in having led to a fatal result in a somewhat short time ; Subadar Runganath a Hindoo aged 39, detachment 30th Regiment N. I. a tall spare man admitted 21st November 1853, complaining of loss of appetite, weakness and lassitude ; he has a remarkably anxious expression of countenance, a feeble intermittent pulse and a pale relaxed and flabby tongue. He does not appear much reduced, his urine and alvine secretions are normal, he has no cough or any thing that might lead one to suspect any thoracic or visceral disease, but appears to have something on his mind and when questioned, said he was thinking about his family. He had previously suffered in this way for some time and when he first presented himself was allowed, at his earnest request, to continue his duty and

take some of the usual remedies for dyspepsia and weakness, but to-day as the weakness has increased and the other symptoms have not abated, he is to keep to his room, try and eat some goats flesh or chicken broth, take zinci sulphas 2 gr. ext. gentiana 5 gr. ter in die with pulv. rhei 3 gr. P. ipecac ½ gr. pulvis zingiberis 3 gr. before meals, and a glass of wine three times a day.

23d.—Appears more reduced, has slight dyspnœa from weakness, his comrades say that he has been for a long time a spare eater from motives of parsimony. He states that meat makes him feel sick. To take arrowroot with sherry and spts. ammon. aromat. spts. æther nitre ½ dr. ter die. From this time he gradually sunk so that the reports do not appear worth repeating except that on the 1st December quina disulphas 5 gr. ter die were substituted for the gentian, and the powder before meals continued in order to excite the appetite.

December 8.—Pulse scarcely perceptible. The patient sits up with a little assistance in order to breathe more freely; but thinks he is dying and has given directions about his property. To take a little wine and ether draught; after this he gradually sunk and died about the middle of the day without having suffered any pain during the whole of his illness. From the quick yet gradual mode of death it appears to me that his disease was that kind of rapid decline which is more common in England and in this case accelerated by poor living and anxiety of mind; but I regret very much that the prejudice of his caste would not admit of a post mortem examination, when I should have expected to find perhaps the commencement of tubercles somewhere; but not sufficient to give any physical signs or possibly there might have been more extensive disease than I was able to discover. Had the steamer arrived

in time it was my intention to try change of air. He had never suffered from beriberi.

MERGUI, 1st *April*, 1854. — E. D. EVEZARD, *Assistant Surgeon.*

Extracts from Meteorological Journal.

MONTHS.	Maximum range of Thermometer.	Minimum range of Thermometer.	Amount of rain in each Month.		REMARKS. Thunder and Lightning.	REMARKS. Rain.
April, - - - 1853	90	74	5	35	15 times or days.	8 days.
May, - - - -	90	75	24	65	29 do.	25 do.
June, - - -	86	73	32	25	6 do.	24 do.
July, - - - .	88	72	30	80	1 do.	27 do.
August, - - - -	88	73	25	30	8 do.	20 do.
September, - - -	86	74	21	70	None.	17 do.
October, - - . .	89	75	16	20	17 times.	11 do.
November, - - -	88	74	7	40	1 do.	8 do.
December, . - -	86	60	1	90	1 time distant.	5 do.
January, - - 1854	88	70	0	0	None.	None.
February, - -	93	80	2	90	3 times.	4 days.
March, - - -	93	75	3	22	14 do.	12 do.
		Total..	166	47		

* The Pluviometer out of order for 3 days and during which time about 3 inches fell each day.

REPORT ON INDIAN DRUGS OBTAINABLE AT MERGUI.

BY ASSISTANT SURGEON E. J. WARING.

No. 1, *Gum Kino.*—The specimen of gum which is herewith forwarded (in small tin box No. 1,) I collected myself from a tree, which grows abundantly about this station, I forward a dry specimen of the tree, seed and flower, (No. 1, amongst the dried plants.) The Burmese name of the tree is *padouk,* and it is evidently a species of the pterocarpus wallichii: this tree grows to a very large size and only flowers once in the year namely

after the first shower of rain at the commencement of the monsoon, when it becomes suddenly covered with one dense mass of yellow blossoms. The flowers rapidly fade away not lasting above one or two days. It is at this period only at which the gum can be obtained from it. This is done by making incisions in the bark of the tree, from which the gum exudes in great quantities. The specimen forwarded was collected in May last, and has lost some of its brilliancy, but when first collected it was like a number of small rubies. It has no commercial value here, not being procurable in the bazaar, although the Burmese doctors are aware of its astringent properties. It is only from the *bark* that the gum exceeds, not from the woody portion.

No. 2.—China Sarsaparilla.—(Iscin-a-pho-taroup.) Of the Burmese is imported in large quantities from Penang and Singapore, and is employed by both Chinese and Burmese in the treatment of obstinate skin diseases, debility, &c. I have used it in some instances, but consider it inferior to the fresh Mergui sarsaparilla, (No. 5.)

Nos. 3 and 4.—These are too closely allied species of simlax, I forward also a dried portion of the stems and leaves, (Nos. 3 and 4, amongst the dried plants) and regret that I am unable to procure the flower, as it blossoms only in the wet season, *i. e.,* from May to October. The Burmese regard them as the same plant, calling them both *kookoo,* but the roots as well as the leaves evidently differ; the root of the narrow leafed one being much smoother and shorter than that of the broad leafed variety. It grows abundantly about Mergui, a cooly collecting for a rupee sufficient to last for some months. It is not purchaseable in the bazaars. The Burmese are well aware of its value in skin diseases and in debility after fevers, &c. and it is used extensively by the Burmese doctors. Some further observations on these plants will be found in the next section.

No. 5.—*The Tseni-a-pho* of the Burmese. This a species of sarsaparilla of the virtues of which as an alterative, mild tonic, and diaphoretic, I entertain a high opinion, having used it in a very large number of cases, and seen evident benefits result from its steady employment. It has always been used by me in the form of decoction oz. 5 of the rhizome to 4 pints of boiling water, boiled down to 2 pints and allowed to stand till cool. The rhizome or root stock, has been always used in the preparation of this decoction, not merely the long fibrous roots, and I feel convinced that more benefit is derived from the former than from the latter, and that in rejecting the use of the rhizome we discard that part of the plant which contains the greatest amount of medical activity. In chronic rheumatism, especially when connected with a syphilitic taint, in general cachexia, in the coughs attendant in old age, or debilitated constitution and in obstinate skin diseases, I have used it with most benefit. In some cases I have given it in combination with dilute nitric acid. In others I have directed the decoction to be taken warm with milk and sugar, when it can with difficulty be distinguished from common tea. The dose of this varies from 2 to 4 ounces thrice daily. Under the use of the above decoction the patient rapidly gains strength and flesh, the appetite increases, the urine increases in quantity, old sores or skin diseases heal, and rheumatic pains vanish.

The other species of smilax, (Nos. 3 and 4,) have occasionally been substituted for this article, but on the whole I think them inferior in efficacy, although very useful remedies. I beg to offer an apology for the length of this description, and the eulogium as perhaps the article may be well known, but I cannot refrain from expressing my opinion, that a medicine which can be procured at so small a cost, (merely that of collecting) and which is possessed of so much medicinal activity, may

prove fully as efficacious as the Jamaica sarsaparilla.

Nos. 6, 7, 8 *and* 9.—*Gums from various species of the Garcinia.*—Nos. 6 and 7, are very common in the vicinity of Mergui, but do not form an emulsion readily with water, and are not purgative in moderate quantities. It is too early in the year to procure the fruit of the trees; but may mention from specimens I saw last year that the fruit of No. 6, is oblong, about the size of a small lime and *furrowed.* Whilst the fruit of No. 7, is round, rather flattened and furrowed though not so deeply as No. 6, I have sent specimens of the trees yielding these gums (Nos. 6 and 7, amongst dry plants) No. 8, is the gum obtained from the mangostein tree, whilst it is in flower and in fruit. The specimen sent I collected myself last year, it has lost much of its brilliancy, being when freshly collected as bright a yellow as No. 6.

No. 9.—A gum from a *species of Garcinia,* which is readily soluble in water, and forms an emulsion readily with the wetted finger. In order to convey to the committee a proper idea of the plant, I have sent specimens of the leaf, flower and fruit in spirit (No. 9 in bottle.) The tree is not common about Mergui, but the gum, which is sent as it was collected a few days ago, is in much demand by the Burmese as a dye for the priests yellow cloths. All the above with the exception of No. 8, (The mangostein) are known to the Burmese by the name of "*Hto-mongo*" whilst the gamboge tree is called *thanan-to.*

No. 10.—*Liquid Storax.*—(No. 10 in a jar.) This is an exudation from a tree known to the Burmese as *nan-to-yoke* which is stated by Mr. Mason who saw the tree in the neighbourhood of Tavoy (natural productions

of Burmah p. 155,) to be the liquid amber altingia. The tree which produces this balsam I have not seen, as it is found only in one place called Panlow, about 30 miles from Mergui where it is represented as growing in great abundance. It flowers in January and February. I understand that there are two ways of obtaining this balsam; one consists in making simple incisions in the bark and collecting it in chatties as it exudes, which it does in great quantities; the second plan is to bore deep holes in the tree several feet from the ground and to light a fire from the roots; as the tree begins to burn the balsam exudes freely, and is collected in proper vessels. This may account for the difference observable in different specimens some being thick, opaque, and highly terebinthinate whilst others are clear, pellucid, and fragrant. The sample I forward is very fine, and was obtained doubtless by the first method. It is very dear. The Burmese are aware of its expectorant properties, which however they became acquainted with through a little work on materia medica published in Burmese by Colonel Burney. I have used this article in the form of pilula styrax composita, but have not seen much benefit from its use. I have not tried it in the form of fumigation in chronic coughs, but in this manner it may be useful. The Burmese also use it as a perfume with oil for the hair and also as a fragrant ingredient for snuffs.

No. 11.—*Tubers which yield Mergui arrowroot and Mergui sago.*—These tubers are solely obtained from the group of islands known as the Seling islands or Mergui archipelago from whence large quantities are imported annually. The tuber is first cleaned well, then it is put in water for one night, after which it is rubbed down on the rough skin of the shark or other rough surface. It is then put into deep cloths

made in the shape of bags, and washed well with water, the fœcula which passes through is collected in vessels, that which remains in the bag is thrown away. The powder is then washed four times in cold water, and is then divided into equal parts, one part is well dried in the sun several times until it is quite hard, when it is powdered, this forms the arrowroot. (No. 12.) The other half is put into sieves made of fine bamboo, and shaken with a circular motion when the powder falls out in the form of little round pieces. These balls are then well washed over the fire in an open iron vessel, after which it is again exposed to the sun till perfectly dry. This forms the sago (No. 13.)

The native name of the plant which yields these tubers is *touk-ta* and is put down in Mason's list, as tacca pinnatifida, and he states that it is the same plant so common in the south sea islands whose tubers there supply the place of bread. In *this* however he appears to be mistaken, as it is the tacca oceanica which is so common in the south sea islands.

No. 14.—An *oil* which is obtained in the province from the nut of a tree, called by the Burmese *kan-hau.* It appears to be a species of bassiæ; but I have never seen the tree. The Burmese use the oil in their food and for other purposes. It can be obtained in large quantities at certain seasons of the year, and would form a good substitute for olive or almond oil in medicine and might prove useful in the arts.

No. 15.—An *exudation* from *hopea odorata* called by the Burmese *then-gan;* when finely powdered it is used by the natives as a styptic in wounds, &c., its action is probably medicinal.

No. 16.—*Catechu.*—A specimen of catechu which is obtainable in any quantity in the Mergui bazaar; it is imported here from Rangoon, vide "Malcom's

travels in south eastern Asia with a full account of the Burmese Empire." Boston 2d Ed. 1839. In volume the first page 161 the following passage occurs. "The shah or cutch tree (mimosa catechu) is indigenous (in Burmah) rising some times to the height of 40 feet, timber rough and durable, much used for ploughs, &c.; from this tree is made the catechu, cutch or terra japonica, chewed chiefly with the betel nut. The wood is hewn into chips, boiled and the liquor inspissated till it becomes thick enough to spread on a mat, when the drying is completed in the sun. It dissolves completely in water, is slightly bitter, highly astringent, and contains 55 per cent. of tannin. The Burmese make two kinds, the red and the black, both from the same tree. The red is preferred in Bengal and the black in China. It is chiefly made in the neighbourhood of Prome, though the tree is found in all parts of the country." I beg to apologize for the length of this quotation, but it may tend to throw some light on the subject, and point out the direction from which further information may be obtained.

No. 17.—Amongst the dried plants is the *Blumea grandis* in the Burmese language *pung-ma-thenig.* I have forwarded it as being a specimen of the plant from which Mr. O'Riely late of Amherst manufactured upwards of an hundred pounds of camphor, which in Calcutta was said to be of good quality. When the leaf of the fresh plant is rubbed between the fingers, it exhales a strong camphoraceous smell. The Burmese use a decoction of the leaves, as a stomachic and carminative. I am not aware that camphor is made from it by the natives. It is a common weed wherever a clearing has been made, and subsequently allowed to run to waste. It may be obtained in any quantity. It blooms in the wet season.

No. 18.—*Cocculus cordifol gulancha.*—This creeper

abounds about Mergui and may be had at a very small cost, a cooly collecting in a day sufficient to last several weeks. I have been in the habit for several months of using it as a simple bitter tonic in the form of infusion (4 ounces of the stem bruised to 4 pints of water) in doses of 4 ounces thrice daily, and consider that it is a very efficacious substitute for the remedies of the same class imported from England. The great objection to its use is the rapidity with which the infusion spoils not keeping good above 24 hours. On the authority of Dr. O'Shaugnessy (Bengal dispensatory) I employed it in several cases of intermittent fevers, and found that although it had the effect of preventing the accession of the cold stage, it had no effect in shortening the duration or mitigating the severity of the stage of pyrexia. In debility after fevers it proves very efficacious, particularly when combined with sesqui carbonate of ammonia. The Burmese do not appear to be aware of its possessing any medicinal properties.

No. 19.—The *seeds* of *isora coryssifolia (helich isora* called by the Burmese, *thu-guay-kee;* they enter into a variety of Burmese nostrums; but I cannot discover that they possess much of any medical virtues.

No. 20.—*Para me leck.*—This root is stated to be the production of Siam. It is very costly here, but is highly esteemed in dyspeptic and nervous affections. I regret that I am unable to afford any information respecting its origin or properties. Its intense bitter taste would indicate a tonic property; when macerated in vinegar, I am informed that it is a most efficacious local application in rheumatism.

No. 21.—(Amongst the dried plants) *lawsonia incrmes?* called dhou by the Burmese who employ the leaves in the form of poultice to painful abscesses, sprains, &c., I have found the leaves vary efficacious in relieving the burning of the soles of the feet and hands to which the

sepoy is so much subject, I know of no other application which affords an equal amount of relief.

No. 22.—A fragrant wood called by the Burmese *hunantheu;* it certainly has the appearance and smell of sassafras, and Mr. Mason in his list of plants found in Burmah has included it under the lauraceæ; the tree yielding this article does not grow in the vicinity of Mergui; but the wood is used for building purposes and can be procured in abundance very cheap; I have used the root in some cases of rheumatism, but as I have given it generally combined with sarsaparilla, guaiacum and other remedies of the same class, it is doubtful how far this contributed, if at all in affording benefit. The leaves called in Burmese *ka-a-way* are exported in large quantities to Rangoon, but for what purpose I cannot ascertain, excepting that they are used for medicine.

No. 23.—*Wood oil.*—Obtained from a tree called by the Burmese *ka-nyeen-ne* (dipterocarpus lœvis?) the tree does not grow in the immediate vicinity of Mergui; but the oil is to be procured in the bazaar in any quantity. It is used chiefly to preserve wood, which it does very imperfectly; as a medicinal agent, it may prove useful as affording an essential oil which according to Dr. O'Shaughnessy is equal to that of copaiba, I have however, given the oil in the form of emulsion in some cases of gonorrhœa, and have generally had to discontinue it, in consequence of its extremely nauseous taste.

No. 24.—*Thest-say* or *theet-sai.*—An article most extensively used by the Burmese as a varnish for boxes, for fixing the gildings on their guadamos or religious figures and for other purposes in domestic life. It is stated to be an exudation of the melanorrhœa usitatissima, but is imported into Mergui chiefly from Moulmein. It is however as a medicine, that it is here noticed being perhaps one of the most efficacious anthelmintics found in these provinces if not in India. The Burmese highly

esteem it in this character and for internal exhibition prepare it in the following manuer; to a certain quantity of *theet-sai*, they add an equal quantity of honey, this is well mixed and put on the fire in an open wide mouthed glazed earthen vessel, where it is allowed to simmer for several hours. It is then boiled quickly and the ingredients thoroughly mixed. This forms an electuary of which the dose is one, two or three table spoonsful according to the age of patient. An adult takes three spoonsful; previous to its use, the patients mouth requires to be well oiled, in order to prevent the electuary sticking to the gums, &c. I have seen it taken on several occasions, and have never observed that it produces much if any physiological effects, beyond a sense of heat in the stomach and occasionally nausea. On the following morning or a few hours after the administration, a dose of castor oil is required, when the worms are expelled *dead* thus showing that it exercises a specific effect upon them. The mode of giving this remedy as above is so nauseous that few persons could be induced to take it, but I beg to suggest the possibility of extracting the essential oil, upon which its efficacy doubtless depends. In its crude state (as per sample) it is one of the most efficacious anthelmintics in the cure of ascaris lumbricoides, I have ever met with.

No. 25.—Turmeric.—A specimen of the turmeric which is grown largely in the province. It is extensively used by the Burmese, not only as a dye, but as a medicine being considered very cooling. It is with a decoction of this that the Burmese women bathe themselves, and their cloths after their confinement, giving to them a very remarkable appearance. A decoction is also employed as a collyrium in ophthalmia, and I have been assured by those who tried it that it is very effectual in allaying the intolerable heat and itching. There is another

therapeutic use of it, which I may be excused mentioning having personally derived benefit from it, namely in coryza, particularly when there is much mucous accumulation in the nasal passages. The remedy is very simple consisting in inhaling the fumes of burning turmeric through the nostrils. It may be held close under the nose, but the mode I have seen most effectual is placing a piece of the burning root under an inverted funnel, and placing the nostril at the small aperture. A profuse secretion of mucous ensues and great relief is afforded. I have seen it used with much advantage on several occasions, I am unable to say whether the same effects would fallow the use of other irritating vapours.

No. 26.—Ka-thai.—Whilst writing this communication I received from a French priest, who is well acquainted with these matters some pieces of wood (No. 26) which he states to be identical with the Samadera and that it can be obtained in the low lands in the neighbouring islands. Should it prove to be the Samadera it is probable that in common with others of the simarubiaceæ, it may prove an excellent tonic and stomachic and a perfect substitute for quassia. The natives make an infusion of the tree, add some salt and administer in coughs, asthmas, &c. They value it as an expectorant, and state that after drinking the above mixture it greatly facilitates the expulsion of mucus. In fever they powder the wood, make it into a paste with salt and a little water and rub it on the tongue and back of the throat.

No. 27.—Kul-lo seed.—Used by the natives as a remedy for skin diseases; they do not give them internally, but rub them up with sulphur and apply them externally over the seat of disease. The efficacy of the nostrum

* The specimen has been misplaced and lost. E. W.

most probably depends upon the sulphur, I am unable to send a specimen of the tree from which they are obtained.

No. 28.—A bitter root called by the Burmese *al-hambay*, (No. 28 amongst the dried plants) shows the leaf and blossom of the tree from which it is obtained, I know nothing of its properties from experience but it is highly esteemed by the Burmese in debility after fevers, rheumatism, &c. The apothecary at this station, Mr. J. White, informs me, that my predecessor assistant surgeon Jowett used it with advantage as a substitute for quassia and Mr. White himself has used it in several instances with benefit in the form of infusion (two scruples to boiling water 1 pint.) It possesses the great advantage of not throwing down any precipitate with the salts of iron. It is procurable in the bazaar.

No. 30.—*Mangostein rind.*—An astringent which I have in some instances found very serviceable in the advanced stages of dysentery and chronic diarrhœa. It has been used in the form of decoction in the following manner; take the rind of two mangosteins, seven fresh cotton leaves, one table spoonful of coriander seeds, and one tea-spoonful of cummin seeds, and have these put into a quart of boiling water, and allow it to evaporate over a slow fire to a pint; of this the dose is four ounces three times daily. The Burmese are aware of its astringent properties and employ it in a formula similar to the above.

Medical plants, &c., growing in the vicinity of Mergui not included in the above list.

Ricinus communis.

Croton tiglium.

Datura, (two species white and purple.)

Calatropis gigantea, (cultivated.)

Puneca granatam, (cultivated.)

Catharto-carpus, (cassia fistula.)

Cassia alata.

Hyperanthera moringa.

Cœsalpinia bunducella.

Cœsalpinia sappan.

Piper nigrum.

Zingiber officinalis ?

Melia azadirachta, (margosa) cultivated.

A species of cardamoms.

MERGUI, 15*th February*, 1853. } E. WARING, *Assist. Surgeon in Medical Charge.*

WITH the view of extending our knowledge of the Materia Medica of India, and promoting the development of the resources of the country in this department, the Medical Board instituted Committees at the stations marginally noted, and issued the following instructions for the purpose of obtaining information on the subject.

Presidency, Nagpore, Secunderabad, Vizagapatam, Bangalore, Cannanore, Trichinopoly.

"The great object in view is the substitution of drugs of Indian produce possessed of similar properties with those now imported from England; it is believed that many such may be attainable, and while the enquiry should include the investigation of all articles likely to be of use, attention should be particularly directed to the obtaining of substitutes for those named in the margin."

Bark and its Alkaloid, Ipecacuan, Jalap, Essential Oils, Ammoniacum Gum, Balsam Peru, Colchicum, Colocynth, ext. Oleum Olivæ.

"The greatest care and precaution will be necessary

in the exhibition of any articles medicinally, and equally great attention in the observation of its therapeutic effects."—November 1851.

The proceedings of the Presidency committee are possessed of interest, and it may be useful to place a summary thereof before the department, not only for information, but in some respects as a guidance for further proceedings.—A. L.

ABSTRACT OF THE PROCEEDINGS OF THE COMMITTEE ON INDIAN DRUGS.

In accordance with instructions from the Medical Board, the Drug committee now present a classified description with appendix and table of indigenous articles of the Materia Medica which have been brought to their notice.

Some of the facts and detailed experiments prove that Southern India is abundantly supplied with simple, energetic, and appropriate remedies well adapted for the treatment of tropical diseases; the Committee are of opinion that many other medicinal substances besides those which have been under consideration might be brought into use, and improved by the operations of the pharmaceutical laboratory and they earnestly call upon their medical brethren in all parts of India to co-operate with them in the further prosecution of enquiries which may be greatly extended and which will prove of general benefit by pointing out the pharmaceutical resources of the country and effecting a considerable saving to the coffers of the state.

It may be well to mention that the object of the enquiry in which they have been engaged has been two-fold.

1st. To substitute drugs of Indian produce possessed of similar properties for articles now imported from England and

2nd. To demonstrate the value of Indian remedies which have as yet escaped observation.

Meetings of the Committee have been held once a month except when there was a paucity of interesting matter.

The following is a condensed summary of the results of the enquiries instituted by the Committee.

ASTRINGENT REMEDIES.

I. KINO.—*New Sources.*—It has been ascertained that this astringent gum is produced over a considerable part of the Tenasserim provinces. Specimens of excellent quality have been received from Mr. Begbie at Moulmein and from Mr. Waring lately at Mergui. A specimen of catechu (believed to be the product called Pegue cutch in the English Market) was forwarded from Rangoon by John Cross Esq., and said by him to be largely exported to England for tanning and dyeing.

The exudation has also been received from Mysore and from Canara, and is unquestionably identical with the kino of commerce.* It exudes from incisions in the bark and requires no manipulation. It is very cheap, and indeed except at the presidency has no commercial value. A good specimen has likewise been received from Dr. Kelaart of Ceylon.

II. CATECHU.—Assistant surgeon Waring has reported the abundance of catechu in the Mergui bazaar, and has sent an excellent sample of the drug. Assistant apothecary Wrightman has given an account of the manufacture of *Kutta* in the Nuggur district of Mysore which corresponds with the description of the process as observed in other parts of India. He states that catechu is sold in Saugu talook at the rate of one anna per seer of 24 rupees weight. A sample of the drug

* NOTE.—For some time this article has been locally obtained for the store department and is now added to the list of country medicines.

adulterated with clay was brought to the notice of the committee by Dr. Cleghorn who condemned the specimen on board an emigrant vessel.

III. The Bæl fruit (Aegle Marinelos Linn) one of the orange tribe long known in Bengal, has lately been employed at Madras, and is found useful in chronic dysentery and diarrhœa, the tree has been propagated at the Horticultural gardens and is in demand: the jelly and liquor Belœ prepared by Pounds of Oxford Street have been imported by Flynn and Co.; eaten as marmalade, the jelly has been found useful in relieving irritation of the mucous membranes. The late Dr. Pereira has given an account of the medicinal use of Indian Bæl.—*See Pharmaceutical Journal,* Vol. X. Page 165.

Dr. Ranald Martin, late of Calcutta writes thus: "On what the curative property of the fruit depends I know not; it is certainly not astringent to the taste or (at all events) very slightly so. I am inclined to believe that much of its efficacy may reside in the thick mucilage which surrounds the seeds of the fruit. A singular property of the fruit is this, that it does not merely restrain undue action of the bowels as in diarrhœa and dysentery, but also in cases of obstinate habitual constipation acts as a mild and certain laxative. It may be said in all cases to regulate the bowels."—*Lancet July* 1853, *page* 53.

IV. Mangosteen Rind.—Mr. Waring has found this a serviceable astringent in the advanced stages of dysentery and diarrhœa. It was used in the form of decoction. Two mongosteen rinds to a quart of boiling water evaporated to a pint; the dose is four ounces, two or three times a day.

This remedy was long since mentioned in Dr. Horsfield's account of the medicinal plants of Java (Trans-

Bat. Society, Vol. 8, page 25) but has not since attracted the attention it seems to deserve.

FEBRIFUGE REMEDIES.

In a country where febrile diseases (as demonstrated by the returns) constitute so large a proportion of the cases admitted into hospitals, indigenous antiperiodics must be of especial value. Different substitutes for quinine in the milder forms of intermittent fever have been brought to the notice of the Committee; upon the specific value of each of these remedies, there is not as yet sufficient information to form the *data* of a report. Amidst the number of facts sometimes not easily reconciled with each other it is difficult to form a distinct conclusion: further trial and experiment is necessary for a satisfactory elucidation of the qualities and uses of these remedies.

The Committee will select the following facts as deserving of notice. Assistant Surgeon Tribe's treatment of intermittent fever by phosphate of lime and sulphur, as recommended by Dr. Blacklock has proved successful; and Mr. Waring has tried repeatedly goluncha (cocculus cordifolius) so strongly recommended as a febrifuge (Trans. Med. and Phys. Socy. Calc. 1827) and reports "that though in every case it had the effect of preventing the accession of the cold stage, it had no effect in shortening the duration or mitigating the severity of the stage of pyrexia. In debility after fevers it proves very efficacious particularly when combined with sub carbonate of ammonia."

In regard to the root of black hellebore and the grey Bonduc nut. Assistant Surgeon Tribe writes, "as an antiperiodic I now never use cinchona bark as both kali khootkee and gudjakai are much more efficacious in smaller doses and much less *nauseous.*—An

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infusion of one ounce or one and a half ounce of the former, or a pill of from five to ten grains of the latter has in my opinion much greater control over the periodicity of fever than any bearable dose of bark."

The Committee are desirous of testing the efficacy of the bark of Soymida febrifuga and hymenodictyon excelsum which have enjoyed celebrity as substitutes for cinchona bark since the time of Roxburgh.

PURGATIVE REMEDIES.

The Committee have directed their attention to three remedies as substitutes for jalap, viz., the seeds of phorbites nil. (*kala-dana*) the seeds of clitorea ternatea, and the indigenous *gamboge* in combination with cream of tartar.

I. The first was used at the General hospital, Monegar choultry, Triplicane and Chintadrepettah dispensaries and was favorably reported upon by the different medical officers as has been already notified to the Medical Board. It has likewise been extensively prescribed with good effect by Dr. Kirkpatrick, Bangalore who writes strongly in its favour.

There can be no doubt that the alcholic extract is a safe and manageable cathartic; the kala-dana is always procurable in the bazaar at a very cheap rate in all parts of the country, although the plant is more abundant in the northern than southern parts of the peninsula.

This creeper belongs to the same family as the jalap plant and abounds in a similar milky juice; but the kala-dana powder being free from the nauseous taste and smell of jalap, gives it some superiority.

II. Favorable accounts of the efficacy of the clitorea have likewise been received from the different charitable institutions, but as the committee have ascertained that kala-dana was supplied by the commissariat at least on one occasion they defer offering a distinct opinion at

present, but Dr. Cleghorn having procured the undoubted clitorea seed, the Committee hope to report decisively at an early date after the monsoon.

III. Samples of fresh gamboge received from Mysore were distributed to the different dispensaries by the Superintending surgeon; the gum resin having been previously triturated with seven parts of cream of tartar which corrected the tendency to tormina in almost every case. Surgeon Arthur has used it at the General hospital. Drs. Kellie, Hunter, Blackloek, Kirkpatrick and Cleghorn have given favorable accounts of its efficacy as also assistant apothecary Wrightman.

It may be given for general purposes when an active purgative is wanted; but it is more especially suited for evacuating the watery accumulations of anasarca and acute dropsy.

There has not been any objection raised to this pulv. gamboge co.; on the contrary patients at the dispensaries occasionally ask for it.

The Committee though considering this a perfectly safe substitute for the pulv. jalap co. do not recommend its use in all cases, and do not advise the gamboge to be given without the supetartrate of potash.

ANTHELMINTICS.

The native medicines of this class are numerous, besides the substances introduced into the pharmacopœia, or mentioned by Indian writers.

Three novel vermifuges have attracted attention. Theetsee oil (melanorrhoœa usitatissima) Koossoo flowers (brayera anthelmintica) and the seeds of the Butea frondosa.

Drs. Mackay and Waring mention the juice of the Burmese varnish tree (theetsee) as a vermifuge. Their accounts agree as to its use; but the latter is somewhat more full.—*Vide page* 415.

Packets of kousso have been received from Aden where it is imported from Abyssinia. It is unquestionably a most powerful anthelmintic, and in the case of an officer, now in Madras, effectually removed a tœnia when turpentine, scammony and other medicines had failed.

Garrison surgeon Butler strongly recommends the seeds of butea frondosa as an anthelmintic. An experienced Hakeem confirms this, who says that two or three seeds of this common tree powdered and given at bed time are followed by the expulsion of the dead worms 24 or 30 hours afterwards.

EMETICS.

In their endeavours to find a cheap substitute for Ipecacuan the Committee have hitherto been disappointed; but they entertain hope of the *tylophoca asthmatica* (the asclepias vomitoria of Koenig and Roxburgh) being found useful. The roots of this asclepiad have had a great name since the days of Roxburgh and notices of its successful employment as an emetic and diaphoretic are to be found in the reports of Drs. Anderson, Russell, and Underwood, which have been confirmed by the trials of Dr. Oshaugnessy and others. There seems no reason to doubt the statement that it is "one of the most valuable medicines in India." It requires to be administered in rather larger doses than Ipecacuan.

Dr. Kirkpatrick intimates in a recent letter that the powdered root has been used extensively by him and with good effect at Bangalore.

Squills.—Several bulbous plants of the liliaceæ and amaryllidaceœ which have enjoyed some reputation as substitutes for squills have been tried without effect, indeed they were found nearly inert and destitute of any certain action.

ALTERATIVES.

Several species of smilax growing in the Indian Archipelago have been advantageously employed by Mr. Waring as substitutes for sarsaparilla.—*Vide page* 408.

ANTACID REMEDIES.

Creta Preparata.—Three qualities of this substance were made from calcined shells, lime, and chalk, the 3d sample was equal in quality to the creta preparata of England and only ⅓rd of the price, the committee therefore recommended that it should henceforth be prepared at the Medical stores.

Alkaline Salts.—A few of these attracted attention as being abundant and cheap in India, viz., carbonate of soda which occurs as a natural efflorescence from the soil, and which yields a considerable per centage of carbonate; this salt was prepared for the committee by Dr. Riddell and by the Secretary, but both samples were found inferior in quality to the bicarbonate of soda in the Medical stores and liable to deliquesce; transparent crystals prepared with more care and by repeated filtration and solution did not deliquesce.

An attempt was made by Mr. Norton to prepare this salt for medicinal purposes, but it was found to be inferior in quality and more expensive than the bicarbonate of soda from England. Crude carbonate of potass was reported to have been repeatedly prepared by the Secretary on a considerable scale for fluxes, chemical experiments and glazing of pottery. It can be made of good quality for little more than the price of common saltpetre, but is so deliquescent, that it must be used within a day or two of its preparation. Experiments to manufacture potass from the ashes of wood did not yield so pure or cheap a salt as that obtained by deflagrating nitre with charcoal.

DETERGENT REMEDIES.

Soaps.—Castor oil, cocoanut oil and gingely oil soaps were prepared for the committee by Mr. Norton. The oils were saponified with a crude carb. of soda prepared from dhobies earth, of these the castor oil soap was the best.

The gingely was the most difficult to saponify. These soaps were used in the dispensaries at the presidency, reported upon favorably, and recommended by the Medical Board to be substituted in hospitals for the soaps now in use.

EMOLLIENT AND DIETETIC REMEDIES.

Fixed Oils.—The following oils of good quality were sent to the committee by F. H. Crozier, Esq., from the N. Division. Neem or margosa oil, melia azedarachta.

Margosa, azadirach indica.

Croton oil, nervalum. Croton tiglium.

Bulrakasee oil, yellow thistle, argemone mexicana.

Cotton seed oil, paratie, gossypinno herbaceum.

Wood oil, ground nut, and gingely oil.

Eloopei oil, bassia latifolia.

Camgoo oil, poongamia glabra.

Mustard oil, sinapis racemosa.

Valassa oil, guizotia abysinia.

Gingely oil, nelannay, sesamum orient.

The above oils were carefully inspected and some were found to be of superior quality. The committee were of opinion that when carefully prepared the gingely oil may be substituted for olive oil, and the cotton seed for linseed oil which it resembles in chemical properties.

The following oils of good quality were also brought to the notice of the committee.

Walnut oil prepared by Dr. Riddell, from the seeds of the aleurites triloba said to be abundant at Bolarum. The tree is very easily cultivated and produces a great deal of fruit which yields about half its weight of oil. This is likely to become an important article of commerce, as it is superior to linseed oil, and is possessed of drying properties. This is the dessy akhroot of Bombay.

The oil of poppy seed (papaver somniferum) and the ground nut oil (arachis hypogœa) were also brought forward as two of the finest oils in India.—The former as a substitute for olive or almond oil, and the latter as a cheap and fine oil for the manufacture of candles, also for burning in lamps and making soap and pomatum; when carefully made, it is superior to olive oil: quantities of it are annually supplied to the Medical stores Bombay.

Kokum oil, a thick vegetable butter obtained from the seeds of the garcinia purpurea was sent by assistant surgeon Leslie, from Honore. This is extensively used by the natives as a substitute for ghee. The oil of mustard seed, sinapis racemosa and oil of jamaica thistle (argemone mexicana) the bulrakassee oil of the N. Circars also appeared to be of fine quality.

An oil called by the Burmese kan tean was forwarded by assistant surgeon Waring Mergui; it is procured from a species of bassia (probably the B. buttyracea) and is used in cooking and for other purposes, it is said to be abundant and cheap and was recommended as a substitute for olive and almond oils. There is one peculiarity about this and the oils obtained from the seeds of two other species of bassia (the latifolia and longifolia,) viz., that in hot climates they separate into a solid fat and a watery mucilage the latter of which very soon becomes rancid. These oils are therefore not

good substitutes for olive or almond oils, they might be employed in the manufacture of soap, candles or pomatum.

From Chittoor,
,, Cannanore,
,, Royapooram,
,, Vizianagrum,
,, Mergui.

Under the head of dietetic remedies were five kinds of arrow-root also salep missree from Ootacamund, and sago from Mergui. Three of the former were carefully examined tested and reported upon by the professors of Botany and Chemistry; the Cannanore arrow-root proved to be the purest, the Chittoor second in quality and that from Royapooram third, both the Mergui arrow-root and sago appeared to be inferior to any of the above. The sample received from Vizianagrum was of very indifferent quality.

CARMINATIVE REMEDIES.

Essential Oils.—The following were prepared for the committee by Messrs. Flynn and Co., anise-seed oil (rimpinella anisum.)

Cummin-seed oil, (cuminum cyminum) fennel seed oil (fœniculum officinalis) lemon-grass oil (andropogon schœnanthus).

The flavor of these was fragrant and their taste pungent, but the quantities were so small that the committee could not determine whether they might be substituted for similar essential oils now supplied from England.

Some fine roussa grass oil (andropogon calamus aromaticus, Royle) was procured from Hingolee, and tried at the dispensaries at the presidency. It was reported

upon as being possessed of stimulant, rubefacient, and carminative properties, and likely to prove an efficacious and cheap substitute for cajeput oil which it resembles. It is specially useful as an embrocation in lumbago and rheumatism, combined with olive oil (2 parts) ; both this and the lemon-grass oil are manufactured extensively by the natives in several parts of India, and if their fragrant and carminative properties were more generally known, they would probably be extensively employed for perfumery, confectionery and culinary purposes.

The committee would beg to attract particular attention to the fact that a good many medicinal and useful plants forwarded to them have been successfully introduced into the Horticultural Society's gardens and are now in a thriving condition and they rely with confidence upon the assistance and co-operation of the garden committee for the propagation and distribution of officinal plants.

Numbers of the medical establishment possess the requisite qualifications and it is hoped that those who are placed in favorable circumstances will be induced to investigate the properties of the indigenous materia medica. The sensible properties of the drugs, the natural affinities of the plants producing them, and finally chemical analysis with careful clinical experiment will reveal the real character of many native remedies not yet fully understood or investigated.

Perseverence in the enquiry will certainly enrich the resources of medical officers wherever located and will place within the reach of the masses of the population a better defined assortment of agents than the native hakeems at present possess.

The result now anticipated will be appreciated in pro-

portion as the education of native surgeons improves under the auspices of government.

THOMAS KEY, *President.*

JOHN E. MAYER,
G. F. C. CLEGHORN, M. D.
ALEX. HUNTER, M. D.
} *Members.*

MADRAS, 9*th Dec.* 1853.

APPENDIX.

A.

Report on the use of the Rousa-ka-tel; oil of the *andropagan calamus aromaticus.*

"This oil has been used externally as a stimulant and rubefacient in bruises and sprains, in the same manner as the cajuput oil, and it seems to act similarly. Internally it has been employed as a vehicle for aperient medicines; it is said to impart an agreeable warmth to the stomach, and to possess a carminative effect. I consider it to have useful properties in this respect, but to be inferior in pungency to the cajuput or mint oils."

CHINTADREPETTAH DISPENSARY, 26*th January,* 1853. } (Signed) ROBERT COLE, *Garrison Surgeon.*

B.

To

The Superintending Surgeon,
Presidency.

SIR,

"With reference to your letter No. 480, dated 23d November 1852, I have the honor to acquaint you that the gamboge and grass oil "Rousa-ka-tel," forwarded by the drug committee for experimental use in the Vepery dispensary have both been tried in many cases, and the former has been

found to be nearly as efficacious in its effects as the gamboge in common use, and the latter combined with cocoanut or olive oil as an external application found beneficial in rheumatic and neuralgic affections."

I have the honor to be, &c.

MADRAS, 13th January, 1853. (Signed) J. KELLIE, *Surgeon 2d District.*

C.

To

The Superintending Surgeon,
Presidency.

SIR,

"With reference to your letter dated 2d November 1852, No. 451, accompanying two packets, one containing one ounce of Mysore gamboge, the other a mixture of gamboge and cream of tartar in the proportion of grs. 3 of the former to grs. 20 of the latter," and requesting that I would subject them to experiment in the general hospital and report to you the result.

In reply thereto I have the honor to state, that I have employed all the mixture of gamboge and cream of tartar received from your office and that I have prescribed the mixture in the cases of Europeans, East indians and natives. I began with the dose marked on the parcel, viz. 23 grs. but I found that this quantity seldom operated at all in any case. I gradually increased the dose to drachms 2, in the latter quantity it generally acted very freely producing copious watery motions accompanied with more or less griping and followed, in some instances, by a sense of weakness or exhaustion. This is rather too large a dose to begin with excepting in cases of constipation, or when it it is known that the bowels are in a torpid condition. Latterly I have employed the mixture in 1 dr. and 1½ dr. doses, never smaller quantities, and, I am of opinion, that the combination is a judicious one, that it will prove to be an excellent hydrogogue cathartic in dropsy, and that in 1 dr. doses it will be a "safe and efficient" purgative in ordinary cases.

The strength of the gamboge is probably somewhat inferior to that of the Siam gamboge, 1½ dr. of the mixture contains nearly grs. 12 of gamboge. This would be considered a large dose of the gamboge in common use.

I have the honor to be, &c.

MADRAS, 6th January, 1853. (Signed) J. F. ARTHUR, M. D. *Surgeon General Hospital.*

D.

To

The Superintending Surgeon,
Presidency.

SIR,

I have the honor to forward the results of my experience of the Mysore gamboge used first in the jail at Shemoga in 1846-47, and latterly at your request in the Triplicane dispensary.

2. In table 1 are the results of 16 cases in which the gum resin was given in powder (*uncombined*) when the irritant properties of the drug were manifest, for vomiting was twice produced and more or less of tormina followed in three instances. In one case only there was no effect.

3. In table 2 are registered the results of 29 cases in which 3 or 4 grains of the gamboge were given in combination with 10 or 12 grains of cream of tartar, in none of these either vomiting or hypocatharsis was produced; in one case only slight griping was complained of, and this ceased when the cathartic took effect: in two there was no motion after the first dose, but full evacuations when repeated.

4. In table 3, (which has been lost), are the result of 17 administrations of the mixture forwarded by you (gamboge grs. 3, potass bitart grs. 20) the results are similar to those of table 2, one case of slight vomiting, and three of griping. The Mahomedans who *always prefer* a hydrogogue, are very

partial to this purgative and ask for it when requiring medicine.

5. From these tables and from the results in many out-patients (not included) who used the same preparation, I consider the mixture of gamboge and cream of tartar to be a cheap and convenient hydrogogue which might with perfect safety be substituted for the compound jalap powder, especially when we desire to evacuate the watery accumulation of anasarca, or to give a brisk purgative in cases of enlarged spleen and liver. In combination with hard powders as cream of tartar, sulphate of potash, &c. the griping tendency is allayed and the gum resin is by no means the severe and drastic purgative which many practitioners imagine it to be.

I have the honor to be, &c.

MADRAS, 15th Jan. 1853. } (Signed) H. F. C. CLEGHORN, M. D.
Actg. Surg. Triplicane Dispensary.

Therapeutic action of Gamboge.

Register of cases in which the Drug was administered.

TABLE 1.

Case.	NAMES.	Age.	Dose.	Motions.	Vomiting.	Griping.	REMARKS.
1	Seniah,	35	Gamboge grs. 4 without Potas Bitart.	2	Once some bilious matter.	......	Evacuations copious and liquid without uneasiness.
2	Sheik Homed,	35	Do.	0	....	Severe.	No effect, had severe griping for a short time, a corpulent man.
3	Syed Abdoollah,	24	Do.	4	....	......	Evacuations copious no pain or uneasiness.
4	Mustafa Khan,	35	Do.	6	....	Slight.	Evacuations copious.
5	Shaik Hussain,	38	Do.(heated)	4	....	......	Do. copious and liquid without uneasiness.
6	Balajerow,	23	Do.	8	....	Slight.	Do. do.
7	Munjiah,	26	Do.	2	....	......	Do. do.
8	Chinniah,	25	Do.	4	4 times some billious matter.	......	Do. do.
9	Balajeerow,	23	Do.	8	....	......	Do. do.
10	Cuneah,	30	Do.	9	....	......	Do. do.
11	Lukkah,	28	Do.	10	....	......	Do. do.
12	Shaik Amed,	25	Do.	6	....	......	Do. do.
13	Thimmiah,	30	Do.	10	....	......	Do. do
14	Hoograh,	28	Do.	2	....	......	Do. do.
15	Nubby Khan,	39	Do.	2	....	......	Do. do.
16	Erogoe,	35	Do.	6	....	......	Do. do.

TABLE 2.

Case.	NAMES.	Age.	Dose.	Motions.	Vomiting.	Griping.	Remarks.
1	Lutchmiah,	26	Gamboge grs. 4 Potass Bitart grs. 12*m.*	6	....	......	Operated copiously without pain or uneasiness.
2	Unamalummah,	42	Do.	5	....	......	Do. do.
3	Murriah,	35	Do.	0	....	......	No effect followed the first dose, the second operated freely.
	2d dose,		Do.	4	....	Slight griping reliev-ed after the cathartic effect.	
4	Busmee,	30	Do.	8	....	......	Evacuations were copious and liquid, no uneasiness.
5	Damah,	50	Do.	7	....	......	No pain or uneasiness.
6	Lutchmiah,	25	Do.	3	....	......	Evacuations copious no pain.
7	Singiah,	18	Do.	6	....	......	Do. do.
8	Cassim Beg,	35	Do.	6	....	......	Do. do.
9	Chowdah,	20	Do.	4	....	......	Do. do.
10	Cullah,	25	Do.	5	....	......	Do. do.
11	Chennabuswah,	35	Do.	5	....	......	Do. do. or uneasiness.
12	Shaik Homed,	35	Do.	6	....	......	Evacuations copious and liquid without uneasiness.
13	Shaik Hoossain,	43	Do.	5	....	......	Do. do.
14	Busmee,	40	Do.	6	....	......	Do. do.
15	Chowdah,	25	Do.	4	....	......	No effect.
16	Murriah,	25	Do.	0	....	......	Evacuations copious, liquid and without any pain or uneasiness.
17	Gowriamah,	39	Do.	7	....	......	
18	Abdool Rhymon,	28	Do.	5	....	......	Do. do.
19	Lalamcah,	38	Do.	4	....	......	Do. do.
20	Marambee,	24	Do.	5	....	......	Do. do.
21	Appoorow,	17	Do.	5	....	......	Do. do.
22	Shaik Emama,	40	Gamboge grs. 4 Potass Bitart grs. 10*m.*	5	....	......	Do. do.
23	Chowryamah,	37	Gamboge grs. 4 Pot. Bitart grs. 10*m.*	5	....	......	Do. do.
24	Abdool Rhymon,	28	Do.	6	....	......	Do. do.
25	Lalamcah,	38	Do.	5	....	......	Do. do.
26	Meer Mahomed,	26	Do.	7	....	......	Do. do.
27	Veeramah,	24	Do.	4	....	......	Do. do.
28	Chowryapah,	27	Do.	6	....	......	Do. do.
29	Abdool Rhymon,	29	Do.	7	....	......	Do. do.

E.

To

The Superintending Surgeon,

Presidency.

SIR,

With reference to your letter, No. 480, dated 23d November 1852, I have the honor to inform you that I have employed the "*grass oil*" "*roussa-ka-tel*" forwarded to me

for trial in the native infirmary and dispensary in cases of rheumatism, in combination with cocoanut oil two parts and grass oil one part, externally in the form of liniment and found it to be of great advantage in recent cases, but in the severe and chronic stage of rheumatism the "*roussa-ka-tel*" in its pure state, has only given relief to the pains. It was also administered internally with aperients, &c. its effect was that of a mild carminative; on the whole, I am disposed to believe that the oil under report can be used as a substitute for cajuput and essential oils. The smell and the flavor when administered internally are particularly agreeable to the patients, covering the taste of nauseous medicines.

I have the honor to be, &c.

MADRAS, 17*th June*, 1853.

(Signed) ALEX. HUNTER, M. D.,
Surgeon 1st District.

Nominal list of Patients to whom Gamboge and Potass Bitartras were administered in the Native Infirmary and Dispensary North side of Black Town.

NAMES.	Sex.	Diseases.	Quantity given.	Date.	Bowels how often opened.	Nature of alvine evacuations.	Effect produced.	REMARKS.
Narsamaloo, ...	M	Anasarca.	Gamboge grs. 3 Potass Bitart Cont. grs. 3. ...	2d Oct. 1852. ...	No effect.	....	....	12th Oct. discontinued complains of debility.
				3d „ „	1	Scanty and firm.		
				4th „ „	2	Scanty and relaxed.		
				5th „ „	Several times.	Copious and watery.		
				6th „ „	2	Do.		
				7th „ „	4	Do.		
				8th „ „	4	Scanty and watery.		
				9th 10th & 11th.	Several times.	Copious and watery.		
Veeragoo, (Boy)	M	General dropsy...	Do.	4th „ „	3	Relaxed.................	....	Dropsical symptoms subsided, omitted.
				5th „ „	2 or 3	Copious and watery.		
				6th „ „	6	Do.		
				7th „ „	4	Do.		
Bolee, ...	F	Ascitis.	Do.	7th „ „	No effect.	....	....	Another dose in the evening.
				8th „ „	2	Scanty and watery.		
				9th 10th & 11th.	3	Copious and watery.		
				12th „ „	2	Do.	Vomited once.	
				13th „ „	6	Do.	Nausea.	
				14th „ „	4	Do.	....	Complains of a burning sensation in the throat 15th omitted.
				24thOct.to3dNov.	3 to 6	Do.	{ .... }	4th Nov. discontinued. 9th „ discharged.
Nacharammah,	F	Anasarca.	Do.	5th & 6th Oct.	No effect.			
				7th „ „	3	Copious and watery.		
				8th & 9th „	5 to 6	Do.	Twice vomited.	Complains of dryness of throat and thirst 10th omitted
Paupah, ...	F	Do.	Do.	9th to 12th Nov.	3 to 4	Do.	13th Discontinued.	Patient becoming weak.

NAMES.	Sex.	Diseases.	Quantity given.	Date.	Bowels how often opened.	Nature of alvine evacuation.	Effect produced.	REMARKS.
Coolamah, ...	F	Ascitis.	Gamboge grs. 3 Pot. Bitart grs. 3.	21st „ „	No effect and was repeated.	....	Says she feels sick at stomach, dryness of throat and great thirst	
					Several.	1st Scibulæ afterwards copious and watery.		
				22d „ „	4	Copious and watery.		
				23d „ „	3 or 4	Do.		
				24th „ „	4	Do.	....	25th omitted.
Nacharamah,	F	Atrophia followed by Anasarca.	Do.	12th to 16th Nov.	3 or 4 times.	Do.	Vomiting and sickness at stomach.	Omitted.
Thoolcanah,	F	Anasarca, ...	Do.	12th Dec. 1852.	1	Copious and watery.		
				13th and 14th.	3	Do.		
				15th	4	Do.		
				16th to 19th.	5 to 6	Do.	....	Discharged cured.
Moonean,	M	Hepat. Acut.	Do.	24th.	1	Do.		
Curnell,	M	....	Do.	25th.	No effect.			
				26th.	2	Scanty and consistant.		
				27th.	6	Copious and watery.		
				28th.	4	Do.		
				29th.	6	Do.	....	30th omitted.
Murriannah,	M	Anasarca.	Do.	11th Jan. 1853.	1	Scanty loose.		
				12th.	4	Do.		
				13th to 15th.	4 to 5	Do.		
Yasah,	F	Anasarca.	Do.	11th Oct. 1852.	2	Natural.		
				12th to 15th.	3	Relaxed.		
				16th to 20th.	Several.	Copious and watery.		
				21st to 23d.	5	Do.	Dropsical symptoms subsided.	Discharged.
Shumsherdeen,	M	Do.	Do.	3d to 6th Nov.	No effect.			
				7th to 14th.	4	Copious and watery, and continued opening his bowels more or less daily.		

Mahomed Saib,	M	Do.	Gamboge grs. 2 P. Bitart. g. 12.	8th.	2	Relaxed.		
				9th to 16th.	5	Freely.		Discharged.
Rungiah,	M	Do.	Do.	28th.	4	Copious and watery.		
				29th.	4 or 5	Do.		30th absent.
Vathanullee,	F	Do.	Do.	28th.	Several.	Do.		
				29th to 3d Dec.	4 or 5	Do.		4th absent.
Francis,	M	Do.	Gamb. grs. 3 P, Bitart. grs. 14.	31st.	No effect.			
				1st Jan. 1853.	4	Do. and continued to operate till the 6th.		Discharged.

Madras,
17th January, 1853.

(Signed) A. HUNTER, M. D.,
Surgeon 1st District.

Table of Articles brought to the notice of the Indian Drug Committee in the order of their Receipt.

No.	*Latin and English Name.*	*Vernacular Name.*	*Medicinal Preparation.*	*Action or Use.*	*Contributed by*	REMARKS.
1	Hymenodyction utile,	....	Bark.	Antiperiodic,	Dr. Wight,	Small samples sent more called for.
2	Soymida febrifuga,	Rohuna, (Hind.)	Do.	Do.	Do.	
3	Clitoria ternatea,	Karkakartan, (Tam.)	Seeds.	Purgative,	Commist. Depart.	A good purgative.
4	Convolvulus turpethum,	Shevadei, (Tam.)	Root.	Do.	Do.	Do. do.
5	Iponica coerulea,	Kaladana, (Hind.)	Seeds.	Do.	Do.	Do. do.
6	Storax,	....	Balsam.	Expectorant,	E. W. Waring Esq	Since indented for.
7	Mysore gamboge garcina pictoria,	Mukki, (Tam.)	Gum Resin.	Purgative,	Dr. Cleghorn,	A safe and efficacious purgative.
8	Mysore kino pterocarpus marsupium,	Cuttacamboo, (Tam.)	Gum.	Astringent,	Do.	Very abundant and cheap.
9	Madras guaiae Iuaiacum officinale,	....	Wood and Resin.	Diaphoretic,	Do.	Trees thriving in the Horticultural Socy. Gardens.
10	Cuttimundoo gum, Euphorbia cuttimundoo,	Cuttimundoo, (Tel.)	Gum elastic.	A substitute for gutta percha,	Walter Elliot, Esq.	Too brittle to be used alone combines with India rubber.
11	Creta preparata of three qualities,	Chuttiseida Chunamboo, (Tam.)	Powder.	Antacid,	Dr. Hunter,	Cheap and easily pre pared.
12	Gum arabic from several species of Acacia,	Vellam pishini, (Tam,)	Gum.	Demulcant,	Do. from Bazaar,	Several kinds procurable.
13	Melia azadirachta, margosa or neeni,	Veppaley, (Tam.)	Bark.	Febrifuge,	Dr. Hunter,	A doubtful antiperiodic.
14	Sulphur and phosphate of lime,	Gundukum and chettei eloomboo, (Tam.)	Powder,	Antiperiodic,	Dr. Blacklock, and Dr. Tribe,	Found to be a good tonic.
15	Black hellebore helleborus niger,	Kadagharoganie, (Tam.) Kala khoothee, (Hind.)	Root,	Febrifuge and purgative,	Do.	Febrifuge properties doubtful.
16	Grey boduc nut, guilaudica bouduc.	Gudgakai, (Tel,) Kalchikai, (Tam.)	Seed,	Antiperiodic,	Do.	Not tried by the Committee.
17	Celastrus nutans,	Mulkaugaine, (Tam.)	Tincture of seeds,	Diuretic,	W. Butler, Esq.	Do.
18	Butea frondosa,	Porasum, (Tam.)	Seeds,	Anthelmintic,	Do.	Do.
19	Theet, tsi, Melanorrhœa resitata,	Khaik peng, (Bur.)	Juice,	Anthelmintic,	G. Mackay, Esq.	A nauseous remedy.

20	Puplay chuckay,	....	Root,	A dye stuff,	Dr. Cleghorn,	Abundant in Ceded Districts.
21	Country soaps,	Nat soukarum, (Tam.)	Soap,	Detergent,	Dr. Hunter,	Quality bad deliquescent.
22	Margosa or neem oil, melia azddiraclita,	Veppalcy nimmay, (Tam.)	Oil of seeds,	Stimulant,	Do.	Useful in itchy eruptions
23	Hill margosa oil, azadirachta indica,	Mullay vaypum, (Tam.)	Do.	Do.	H. F. Crozier, Esq.	Do. do.
24	Croton oil, croton figlium.	Nervalum, (Tam.)	Do.	Purgative,	Do.	Much used by the native practitioners.
25	Cotton seed oil, gossypium herbaceum,	Paratic ennay, (Tam.)	Do.	Emollient,	Do.	Resembles linseed oil.
26	Bulrakasee oil, argemore maxicana,	Bulrakasee, (Tel.)	Do.	Do. and dietetic,	Do.	A fine sweet oil.
27	Wound oil, gingely and ground nut oils,	Nul ennay and vereudalay ennay, (Tam.)	Do.	Emollient.	Do.	A medicated mixture of oils and roots.
28	Mustard oil,	Cadoocoo, (Tel.)	Do.	Do. and dietetic,	Do.	A fine aromatic oil,
29	Upa oil, bassia latifolia,	Eloopei ennay, (Tam.)	Do.	Emollient,	Do.	Makes good soap, and candles.
30	Caugoo oil, poongamuray glabia,	Poonga ennay, (Tam.)	Do.	Do.	Do.	
31	Valasa oil, guizotia abysinia,	Valoosoo, (Tel.)	Do.	Do.	Do.	A good oil.
32	Gingely oil, sesamum ori entale,	Nul ennay, (Tam.)	Do.	Dietetic, emollient,	Do.	A very fine oil when well prepared.
33	Gingely oil soap,	Nul ennay soukarum,	Soap,	Detergent,	Mr. G. Flynn,	A good soap.
34	Castor oil soap,	Chitaminaka ennay, do.	Do.	Do.	Do.	Do.
35	Cocoanut oil soap,	Thenga ennay, (Tam.)	Do.	Do.	Do.	Difficult to saponify.
36	Carbonate of soda,	Oyer munnoo, (Tam.)	Crude salt,	Antacid,	Dr. Riddell,	Very abundant.
37	Land salt,	Culoopoo, (Tam.)	Purified do.	Dietetic,	Do.	Do.
38	Chaksoo cassia absus,	Kumkootee, (Hind.)	Seeds,	Caustic irritant,	Dr. McPherson,	Small quantity received.
39	Asclepias vomitoria,	Coorinja, (Tam.)	Root,	Emetic,	Dr. Kirkpatrick,	Do.
40	Arrowroot of 4 qualities maranta armedinacea	Vellay munjal, (Tam.)	Fecula,	Dietetic,	Dr. Hunter,	Chittoor arrow root best.
			Do.	Do.	Do.	Cannanore, do. 2d.
	curruma montana and				Do.	Royapooram, do. 3d.
	tacca primcatifida,	....	Do.	Do.	Dr. Waring,	Not chemically examined.
41	Roussa grass oil. Andropogon calamus aromaticus,	Munjin pilloo ennay, do. Roussa-ka-tel, (Hind.)	Essential oil,	Stimulant, carminative and rubefacient,	T. Key, Esq.	Tried and reported upon very favorably.

No.	*Latin and English Name.*	*Vernacular Name.*	*Medicinal Preparation.*	*Action or Use.*	*Contributed by*	REMARKS.
42	Calotropis gigantea.	Yercum, (Tam.)	Leaves and juice,	Stimulant fomentation, Caustics,	Dr. Kirkpatrick,	Very abundant.
43	Salep misree,	Sala misree, (Tam.)	Fecula,	Dietetic,	T. Key, Esq.	Not tried or examined.
44	Cama edulis, *tous let mois* starch,	Tous les mois,	Fecula,	Dietetic,	Dr. Hunter,	Do. do.
45	Chalybeate water from		Natural spring water,	Tonic,	J. Fraser, Esq.	Percentage of iron small a doubtful shaly beate.
46	Aromatie gum resin gardenia gummifera,	Dekamunnee,	Gum resin,	Not yet ascertained,	F. Fletcher, Esq.	Free in Hort. Soc. Gardens. gum now being collected
47	Liquorice root,	Adithee mathurum,	Decoction of root,	Expectorant,	J. Fraser, Esq.	Source doubtful.
48	Manganese ore,		Sesquioxide,	A chemical Agent,	Maj. Henderson,	Abundant in S. India.
49	Anise seed,		Decoction of seed,	Carminative,	Dr. Burrell,	Small sample reserved.
50	Assafœtida,	Perungayum, (Tam.)	Gum resin,	Expectorant and quemeagogue,	Do.	Do. do.
51	Frankincense,	Sambranee, (Tam.)	Do.	Disinfecting Agent,	Do.	Do. do.
52	Black Hellibore,	Kadagharoganie, (Tam.)	Seed and root,	Purgative,	Do.	Do. do.
53	Henbane seed, Hyoscyamus niger,		Seed and leaf,	Narcotic and sedative,	Do.	Plant now growing abundantly at Hoonsoor.
54	Kokum oil, garrinia purpurea,	Kokum, (Can.)	Oil of seeds,	Dietetic,	Dr. Leslie,	Used as butter by the natives.
55	Lemon gras oil, audropogon schœnamthues,	Eloomichum pilloo ennay, (Tam.)	Essential oil,	Carminative and rubefacient,	Messrs. Flynn and Co.	Flavor very fragrant.
56	Anise seed oil,	Sombee ennay,	Essential oil,	Carminative,	Do.	Quality good.
57	Cumin seed oil, eummium eyrniume,	Siragum ennay,	Essential oil,	Carminative,	Do.	Do.
58	Fennel seed oil, foeniculum officinale,		Essential oil,	Carminative,	Do.	Do.
59	Kino,	Cuttacamboo pisini, (Tam)	Gum,	Astringent,	Dr. Waring,	Tree doubtful.
60	China sarasparilla smilax, 4 species,	Tsein-a-pho, (Bur.)	Decoction of root,	Alterative and diaphoretic.	Do.	
61	Garcinia, gums 3 species,	Hto-meugo, (Bur.)	Gum.	Mild purgative,	Do.	Very like gamboge in appearance and action.

62	Mergui arrow root, tacca pinnatifida,	Touk-too, (Bur.)	Fecula,	Dietetic,	Dr. Waring,	
63	Mergui sago, tacca pinnatifida,	Touk too, (Bur.)	Do.	Do.	Do.	Similar to the above but prepared differently.
64	Bassia butyracea oil,	Kan tean, (Bur.)	Oil,	Do.	Do.	Used for cooking.
65	Hopea odorata,	Thew, (Bur.)	Gum,	Styptic,	Do.	Applied to wounds.
66	Catechu, mimosa catechu,	Shah-cutch or terra ja pouica tree,	Gum,	Astringent,	Do.	Abundant and cheap.
67	Blumea grandis,	Pung-ma-theing, (Bur.)	Decoc. of leaves,	Tonic and carminative,	Do.	Yields good camphor.
68	Cocculus cordifolius,	Gulaucha,	Infusion of stem,	Bitter tonic,	Do.	Supposed to be febrifuge.
69	Isora corylifolia or helicteres isora,	Thu-quay-kee, (Bur.)	Seeds,	Demulcent,	Do.	A favorite remedy with the Burmese.
70	....	Para-me-leck, (Bur.)	Root,	Tonic,	Do.	Properties not well known.
71	Lawsonia inermis,	Dohu, (Bur.) Henneh,	Leaves,	Emollient,	Do.	Releaves burning of the hands or soles of the feet.
72	Sassafras,	Oman-teng, (Bur.)	Wood,	....	Do.	Action doubtful.
73	Leaves of sassafras,	Ka a-way, (Bur.)	Leaves,	....	Do.	Largely exported from Burmah.
74	Dipterocarpus laevis,	Ka nyean-ne, (Bur.)	Wood oil,	Unascertained,	Do.	Yields an essential oil resembling copaiba.
75	Melanorrhœa, usitatissima,	Theet-tia, (Bur.)	Oil,	Authelmintic,	Do.	Used chiefly as a varnish.
76	Curcuma, turmeric,	....	Root,	Stimulant and errhine,	Do.	Much used in catarrh.
77	Simaruba,	Ka-thai, (Bur.)	Wood,	Tonic,	Do.	Substitute for quassia.
78	....	Kull-lo, (Bur.)	Seeds,	Stimulant application,	Do.	Used in cases of itch.
79	....	Ah lam-bay, (Bur.)	Root,	Bitter tonic,	Do.	Substitute for vention.
80	Entada pursotha,	Kung nym, (Bur.)	Seeds,	Febrifuge,	Do.	A large pod.
81	Mangosteen rind, garcinia mangostana,	....	Rind of fruit,	Astringent,	Do.	Extensively used in dysentery.
82	Hydrocotyle asiatica,	Vullarie, (Tam.)	Powder of dry plant,	Antidy philitic,	E. Balfour, Esq.	Plant abundant useful in healing ulcers given in powder infusion or decoction.
83	Aleurites triloba, country walnut oil,	Deesy akloroot, Parsee.	Oil of seeds,	Emollient,	R. Riddle, Esq.	A good substitute for linseed oil.

No.	*Latin and English Name.*	*Vernacular Name.*	*Medicinal preparation.*	*Action or Use.*	*Contributed by*	REMARKS.
84	Poppy seed oil, papaver somniferum,	Cuscussa ennay, (Tam.)	Oil of seeds,	Dietetic,	Dr. Hunter,	A fine oil made in Madras
85	Ground nut oil, arachis hypogoea,	Vercuddaly ennay, (T.)	Oil of nut,	Do. and Emollient,	Do.	A substitute for olive oil or almond oil, cheap.
86	Catechu bark,	Cuscuttay puttay, (Tam.)	Bark of accaria, c.	Astringent,	Mr. G.S. Wrightman,	Abundant at Mysore.
87	Pegu catechu,	Cutch,	Gum,	Astringent,	M. Cross, Esq.	Very abundant and cheap.
88	Tylophera asthmatica,	....	Seeds.	Emetic,	Dr. Kirkpatrick,	
89	Purified carbonate of soda, from Dhobee's earth,	Poonheer, (Tam.)	Purified salt,	Antacid,	Dr. Hunter,	Not so cheap as English.
90	Carbonate of soda, from ashes of wood,	....	Granular salts,	Do.	Do.	Dirty only fit for soap making.
91	Do. from ashes of the lalicornia indica,	....	Purified salt,	Do.	Do.	Not so cheap as English plant abundant.
92	Carbonate of Potass from nitre and charcoal,	....	White salt,	Do.	Do.	A good and cheap source of a nearly pure alkali.

Abstract of the Preceding Table.

Alternative remedies.	China Sarsaparilla and var. of smilax.
Antiperiodic and Ferbrifuge remedies.	Hymonodyction utile. Soymicla febrifuga. Melia azadirachta or neem. Guilandina bondue. Enthada pursœtha. Sulphur and phosphate of lime.
Antacid remedies.	Creta preparata. Corbonate of soda from 3 sources. Carbonate of potass.
Anthelmintic do.	Butea frondosa or porasum. Thet-tsi juice.
Antisyphilitic do.	Hydrocotyle asiatica.
Astringent do.	Mysore kino. Mergui do. Pegu catechu. Mysore do. and bark Mergui do. Mangosteen rind.
Carminative.	Roussa grass oil. Anise seed do. Lemon grass do. Cummin seed do. Fennel seed, do. Blumea grandis.
Caustic irritant.	Chaksoo seed. Yercum juice, calatropis.
Chemical agents.	Sesqui and peroxide of magnanese. Alkaline carbonates.
Demulcent remedies.	Gum Arabic several varieties. Isora corylifolia.
Detergent do.	Country soaps. Gingely oil soap. Castor oil do. Cocoanut oil do.
Diaphoretic do.	Guaiacum officinale. Smilax sarsaparilla.
Diuretic do.	Celastrus nutans.
Disinfecting agent.	Frankincense.
Dye stuff.	Puplay chukay.
Dietetic remedies.	Arrow root from Chittoor, Cannanore, Madras, Vizianagaram, Mergui. Canna edulis or tous les mois. Sogo from Mergui. Salep missree.

Abstract of Table—continued.

Dietetic remedies.	Land salt. Gingely oil, ground nut do. Kokum do. bassia do. Mustard do. poppy seed do. Bulrakasee do.
Emetic do.	Asclepias vomitoria or tylophora asthmatica.
Emollient do.	Cotton seed oil. Caugoo do. Eloopei or ilpa do. Wound do. Valasa do. Country Walnut do. Mustard do. Ground nut do.
Emollient cataplasia.	Leaves of lawsonia inermis.
Errhine remedy.	Turmeric root.
Expectorant do.	Storax. Liquorice root. Assafœtida
Gum Elastic.	Cuttimundoo gum.
Narcotic.	Hyoscyamus niger.
Purgative remedies.	Clitoria seeds. Convolvulus turpithum, shevadix. Ipomea coerulea kaladana. Mysore gamboge. Mergui do. 4 var. garcinia. Croton oil. Helleborus niger. kala kootkee.
Stimulant do. (external.)	Margosa oil. Hill margosa do. Calotropis gigantea juice.
Styptic do.	Hopea odorata.
Tonic do.	Simaruba. Coculus cordifolius. Blumea grandis. Ali-lam bay. Para me-leek.

FINIS.

APPENDIX.

CONTINUATION OF THE CASE OF ANEURISMA, GIVEN AT PAGE 229.

Serjeant William Hayter, aged $32\frac{1}{4}$, *1st Madras Fusiliers.*

Arrived at St. Thomas' Mount on sick leave in January 1853, when he was placed on the convalescent list and watched carefully; he had made good progress in walking; the remains of the aneurismal sac felt like an enlarged inguinal gland, about the size of a nut, some œdema of the leg. On the 8th July he was taken into hospital more as a precautionary measure, having suffered from aneurism of the left iliac artery; on this occasion he complained of an oppressive feeling between the left clavicle and nipple, and of uneasiness of left shoulder and arm, considerable external pulsation of abdominal aorta, was very nervous, no unusual sound of heart or arteries, occasional nervous pains in different parts of body, and palpitation of heart; he continued without any material change till the 14th October when he was discharged as a convalescent at his own urgent request. During this period, had tincture digitalis, sedatives, tonics, leeches and camphorated frictions, particular attention was paid to his bowels, and his regimen strictly attended to. Returned to hospital on the 17th October complaining of a dull pain in the precordial region, and occasional palpitation, particularly after meals, or exertion, heart's action accelerated and irregular, not at all synchronous with the pulse, which is quick and intermitting at times, some difficulty in breathing, with a tickling cough and mucous expectoration, respiration puerile, with a mucous râle over the upper lobes of both lungs, abdomen tympanitic, bowels relaxed; in a few days the left foot and leg became œdematous which extended to the right lower extremity soon after, countenance pale and sodden, urine scanty, face puffy. Continued much in the same state, some times better, and at other times worse, with sleepless nights from dyspnœa till the 11th November, when cold sweats broke out all over his body causing him to feel chilly

at night; on the 13th was attacked with great pectoral oppression followed by violent coughing and spitting up of blood of a florid frothy appearance which continued more or less till the 18th when his countenance became dejected and ghastly, with every symptoms of approaching death, and he expired the same night at ½ past 11 o'clock.

Sectio Cadaveris 10 hours after death. *Appearance* of the *body*. Right breast considerably more prominent than the left, body generally œdematous, especially the lower extremities, tumour in the left iliac region scarcely perceptible; *heart*, on opening the pericardium no unusual quantity of fluid was found, but the heart considerably enlarged, and the veins much engorged. *Dissection of the heart*, vessels much distended, before opening the cavities it weighed 30 ounces.

Left Ventricle, contained a mass of black coagulated blood, cavity unusually enlarged, and parietes thickened. *Left auricle* also distended, valves not enlarged, but slightly thickened. *Right Ventricle* also distended with black coagulated blood, no serum in either. *Right auricle*, also much distended, valves nearly obliterated, heart weighed when dissected 21 ounces.

Lungs, emphysematous and engorged with blood. *Liver* large mottled, weight 3 lbs. 13 oz.

Kidneys natural. On a section being made in the course of the external iliac artery of left side, an aneurismal tumour of the dimensions of a hen's egg was discovered on the margin of the base of Scarpa's triangle, being immediately beneath Pouparts ligament of that side, and where the external iliac becomes the femoral artery; on incision, the sac of the aneurism was totally blocked up by fibrinous deposit, thus obliterating the calibre of the vessel. The coats of the artery were considerably thickened; no aneurism or any abnormal appearance was to be seen throughout the whole course of the circulation.

S. A. G. YOUNG, Surgeon,
In Medical charge,
Cantonment.

St. Thomas' Mount,
4th April, 1854.